Creating Research Excellence University in Ethiopia:

A conceptual analysis

Dereje Demie Geleta

Master's Thesis

European Masters in Higher Education

Faculty of Education, Institute for Educational Research

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Abstract

Ethiopia is one of the highly populated and economically very poor African countries. Like many other countries, Ethiopia too expects education, specifically higher education to influence its development effort. It is with such expectation that its expenditure in higher education is ever increasing and a number of "same" kind of institutions are being built. Nevertheless, the country still lags behind even by Sub Saharan standard both in research production and researcher population.

There has been dilemma about how the national higher education system can satisfy the ever-increased expectation of a nation. One area of this dilemma has been on the issue of differentiation like having nation's flagship institutions. However this issue hasn't been addressed from Ethiopian perspective so far. For this reason, it is the purpose of this study to look into the creation of Research Excellence University (REU) in a way to create diversity in the system. Thus, the study explores how teaching, learning and research are conceptualized in REU. In addition, it also characterizes how REU is organized, financed and interacted with industry.

Qualitative study has been pursued. It is solely based on document content analysis of selected four highly excellent research universities found in US and UK namely: University of Cambridge, University of Oxford, University of California-Berkley and Harvard University.

Previous studies have confirmed that differentiation is a natural process and often elaborated in light of natural law. Nevertheless, to create REU at this point requires speeding up the evolutionary process.

To speed up the process; government has to legitimize, finance and encourage competitiveness. At the same time, a REU should has to make sure among other things that: Merit prevails in recruiting staffs and students; Use finance to upgrade infrastructure and perform quality research; It has to incorporate teaching technology and student independent learning; More institutional autonomy, academic freedom, participatory leadership are in place; Furthermore, the environment support peer review and publication as well as involve undergraduate in research; Lastly, it need forging a closer link of university research with

entrepreneurs and industry through spin off companies, Science Park and Technology Transfer Offices.

Major word: Excellence, research university, research and differentiation

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Acronyms

AAU	Addis Ababa University
ACT	American College Test
AIST	African Institute of Science and Technology
AIMS	The African Institute of Mathematical Science
AP	Advance Placement
BPR	Business Process Reengineering
CHEPS	Center for Higher Education Policy Studies
CSA	Central Statistics Authority
DAAD	German Accadamic Exchange Services
GPA	Grade Point Average
HEFCE	Higher Education Funding Counicl of England
HERQA	Higher Education Relevance and Quality Agency
HESC	Higher Education Strategic Center
MIT	Massachusetts Institute of Technology
MOE	Ministry of Education
OECD	Organization for Economic Co-operation and Development
ORU	Organized Research Units
OTD	Office of Technology Development
Oxbridge	University of Oxford and University of Cambridge
RAE	Research Assessment Exercise
REU	Research Excellence University
RU	Research University
SAT	Scholastic Assessment Test
SJT	Shanghai Jiao Tong
TDA	Training and development Agency
THES	Times Higher Education supplement
TSA	Thinking Skill Assessment
UK	United Kingdom
URAP	Undergraduate Research Apprentice program
UROP	Undergraduate Research opportunity program
US	United State of America
UNESCO	United Nations Educational, Scientific, and Cultural Organization
WCU	World Class University

Chapter I: GENERAL OVERVIEW

There is always an issue of class in all walks of life. One excels in conducting its operation compared to others and hence recognized. Others aspire to become the next eye-catching performer. Again at other time the earlier feels its about to be overtaken by its followers and try really hard to isolate itself in distance from the follower and so on. The same truth follows with the world's finest higher education institutions. In alignment to this fact, these world finest higher education institutions excel in their performance or reputation that academic staffs and students would like to be part of. Similarly, such institutions are aspired by so many countries.

Since top institutions are determined to improve their position in the rank, they are likely; to excel in education, to produce more research, to produce groundbreaking findings and so on. The issue of the criteria used to measure ranking is still debatable. However, there are undeniable facts that other universities can learn from these successful universities by making them as point of reference.

The idea of exploring the creation of Research Excellence University (REU) is useful primarily for two reasons: First, It will add to an overall understanding of REU, as little is known about it. This topic gets momentum among scholars and policy makers only recently with the advent of the World University Rankings, since 2003. Besides, many excellence initiatives in higher education are taken by nations and multilateral organizations in the last two decades or so (Salmi, 2009).

Second, even what is known about REU is confined in the developed world; perspective from developing world is required in order to have a holistic understanding of research excellence. This will further help in enriching the higher education system of developing countries. Scholars have not visited the topic notably from the Ethiopian side. Perhaps this is due to:

A) The fact that developing countries like Ethiopia are not into the so called "academic arm race".

B) Dominance of the discussion on issues of access and equity in higher education institutions rather than excellence and producing highly talented graduates.

However, the recent attention given to knowledge and its production in both developed and emerging countries; and the almost negligible involvement in research by developing countries like Ethiopia made the idea to look into building REU more compelling. Therefore, this study will add to the understanding of REU and its perspective shall be from the developing world. By and large, the topic is contemporary, not well researched and is worth studying.

1.1 Research problem

There are several phenomena or rather development that can be observed from the Ethiopian higher education system that can be referred to as symptom for the real problems. These symptoms are phenomena that are sign and not real problem by themselves. In fact they lead into probing the real problems, which will be addressed shortly in this study. The symptoms are: First and foremost, the present expansion policy is horizontal, adding more of the same kind of institutions. It also considers every institution as equal, while in fact institutions have never been equal. Hierarchical expansion is almost neglected in the system, the need for diversification is apparent.

Second, the fact that private higher educations are flourishing and they are fulfilling at least the 'access' function. However, due to their especial mission of profit, since 95% of them are a for-profit type (Tamirat, 2008), they are not engaged in any significant research activities.

Third, highly talented personnel of the nation is leaving the country in search of better equipped research facilities and of course better paid job abroad, brain drain.

Finally, the global trend of paying attention to the world university ranking and those who afford to have one pledged in building World Class University (WCU). Ethiopia is not an exception; the aspiration in building WCU is inevitable if not now sometimes in the future.

Presumably, REU shall supplement the absent function such as; keeping the best and the brightest students and staffs from leaving the country; catching up with global development; lastly, beyond the access function by being a place where the highest level of intellectual

activity (teaching and research) to take place. In a way it also serve as a role model for other institutions to look up to.

The above presumption begs the question about areas of Research Universities (RU) that need to be explored in order to create similar one. The obvious ones are: how REU manage its finance, staffs and students; the intensity of intellectual activity teaching and research; and lastly its interaction with industry. Hence, taking into account the trend in the world and Ethiopia in particular the broad and subsequent specific questions can be framed as follows:

The broader question is:

How REU could be epitomized from the Ethiopian perspective?

The specific questions are:

How teaching, learning and research are conceptualized in REU?

How REU is characterized in terms of its organization, finance, staffs and students recruitment and interaction with industry?

1.2 Purpose of the study

The study has a purpose of exploring the rational behind the need to have REU by looking at the higher education system in Ethiopia in connection to other systems that already have REU. Further, the study explores how to make operational such a university taking into account the ground reality in Ethiopia.

Finally, it aimed at framing the general pattern of organizational environment and activities as REU has quite different mission to accomplish and perhaps require different mechanism in several aspects.

1.3 Significance of the study

The study touches up on Excellence University and for sure it will add up for the already rare understanding of such university. It has primarily targeted in understanding what is happening

inside REU. It also identifies and address issues that must be taken into consideration while building such University. Hence, the study has scientific relevance. It will be useful as future reference to researchers who are interested generally about Excellence University and specifically in Ethiopia.

Secondary to the scientific significance, this study might have practical importance in informing policy makers or individual institution. Consequently, it may assist the existing higher education institutions if they want to pursue excellence. Further, It will inform various stakeholders including government in considering building REU in the nation.

Finally, organization like ministry of education, science and technology commission, capacity building, non-government organizations who are interested in higher education may refer the finding in the future policymaking.

1.4 Scope of the study

The study touches up on the characteristics of REU. Accordingly, research and knowledge production have dominant discussion than teaching, albeit excellence in teaching is not totally disregarded. In fact teaching and learning has been dealt as one of the theme. In addition to this, student and staff recruitment, finance, organizational structure and industrial relation are major areas that are discussed at length.

In no ways does this study have the ambition of importing the obsession of creating world-class University (WCU). However, characteristics of WCU have been explored, since excelling in research, teaching and learning among others have been used as a base to rank them.

The higher education system reality in Ethiopia has been taken into consideration in developing model REU so as not to be unrealistic in aspiring to build similar one.

1.5 Organization of study

The first chapter (current one) introduces the study by describing the research problems. Second chapter deals with the literature review. Major themes in connection to research

problems and objectives are explored at length in this chapter. Third chapter discuss the conceptual framework for the study. This chapter basically guides the study by providing a theoretical building block. Fourth chapter reveals the research design to be followed. Fifth chapter is about the research context. It describes the Ethiopian higher education. Sixth chapter presents data of the selected case universities and countries. Finally, the seventh chapter presents the discussion and conclusion of this study.

Chapter II: LITERATURE REVIEW

2.1 Introduction

The literature review is approached in such a way that it will have a means to inform the subsequent part such as conceptual framework, research design, analysis, discussion and the REU model. Accordingly, it has consulted various publications and reports including books, working papers, articles and official web sites with specific reference to; RU, WCU, REU and excellence. The themes that are dealt include university rankings, teaching and learning, research, finance, management, university industry relation, staffs and students recruitment. In each theme, research universities practise have been dealt to characterize and conceptualize complete picture of RU.

Increasingly nations seek to advance in science and technology to mitigate socio-economic problems. Nevertheless, there are disparities on the level of advancement across countries. This hampered countries ability of solving some of country-specific critical problems.

Most strikingly, it has been a while since Porter identified the competitive advantage of firm, which can also be wisely applied to countries competitive advantage. Highly educated individuals are likely to bring success to an organization or may engaged in new entrepreneurial activity (Porter, 1990). This in turn brings competitive advantage to the nation as successful organizations of nation compete globally. 'There is clearly a relationship between excellence in science, especially basic research and international competitiveness in production but the relationship is not direct' (Gibbon, 1994:129). It can be possible to deduce that excellence in science is condition for competitiveness but not sufficient, other matters play a role as well.

Therefore, to enjoy the advancement of science and technology by means of easy adaptation to those who are not capable of producing at the moment; to mitigate the real problem of developing countries; also to be part of the globalized world knowledge production and to be competitive in this contemporary and possibly the future knowledge age, nation should strive to build strong knowledge producing community.

2.2 Building strong scholarly community

One perspective to replay to the quest of building strong scholarly community is to look into how other nations have achieved scientific advancement and to what extent their research universities have played a role for advancement. Scientifically the most advanced nations according to their chronological order are believed to be Britain, France and Germany in the 17th, 18th and 19th century respectively. Then, comes the United state from the 20th century till today (Bennich-Björkman, 1997). These countries have well established universities and research centres which are capable of pushing the science frontier forward.

The United State, the most advanced nation of the 20th century, also dominated the world university ranking. Next to the US, UK and Japan follows in the lead in the two most prominent world university-ranking tables, SJT (Shanghai Jiao Tong) and THES (Times Higher Education Supplement). Taking these facts into consideration, it may not be a coincidence that these nations, dominated the world university ranking by having most of the best world-class universities and their advancement in science and technology.

For scientific advancement to prosper, higher education institutions contribution is tremendous both in supplying researcher and as place for knowledge production. In terms of training graduate by inculcating the necessary ethos and calibre to produce knowledge, higher educations help in the advancement of knowledge. This is common for almost all nations.

On the otherhand, the extent to which nation's higher education institution involvement in actual knowledge production differs. For instance, in France, there is parallel production of research at elite research centre (CNRS) Centre National de la Recherché Scientifique and INSERM for medical research (Deer, 2009). But majority of the western universities are place of knowledge production (Bennich-Björkman, 1997). Since higher education institution is known as place where knowledge is produced and also place where knowledge producers are trained, the idea of building such an institution is indispensable for scientific advancement.

The important question following this shall be how to bring the institutional set up and culture of strong research in a country where the production of knowledge is almost negligible? In seeking an answer, it is obvious to look into the ranking table for possible identification of successful universities.

So far, the two world university rankings have failed to measure how institutions are doing in terms of knowledge transfer, life long learning, local and regional engagement (Van der Wende, 2008). On the contrary, the ranking measures substantially at least quality of research production. The ranking organizations have employed quite different methodology. Hence, disparities in the ranking position of universities are inevitable. With out counter arguing to this fact, certain institution especially from the US and UK have almost exclusively dominated the two rankings.

2.2.1 World University Rankings

Based on the SJT World University ranking for the year 2009, top 100 is dominated first by US University by 55% and UK follows in distance second place by 11%. In the top 500 other nation's university has chance to participate the league and even then 30% of the share is still hold by the US and 8% by the UK. The same way, in THES ranking for 2009, 18 of the top 20 institutions are either from US or UK. What do these figures mean? For clear understanding, close examining the parameter used in the ranking is pertinent.

In SJT ranking, the basic parameters are as follows:

1. *Quality of education: through alumni of an institution winning Nobel prize Weighted 10;*
2. *Quality of Faculty: number of prize staff has won and number of times the researcher is cited, weighted 20% each and 40% in total;*
3. *Research out put: the scientific paper published by staff at nature and science (Weighted 20%) and papers indexed in science citation index-expanded and social science citation index (Weighted 20%);*
4. *Per capita performance: per capital academic performance of an institution. Weighted 10% (SJT, 2009).*

Looking into SJT ranking methodology, quality of education is measured from alumni perspective, alumni winning a Nobel Prize. It may show quality of education but in limited sense. To begin with there are very few disciplines which award Nobel Prize. On top of this, so far only few people are awarded with this prize, which makes it even weaker in general to make sound measurement of teaching quality, not to mention only a weight 10% is apportioned for education.

Paradoxes also exist in measuring quality of teaching. It involuntarily measures research, due to the fact that Nobel Prize winner most often than not are quality researcher. It is highly likely that alumni and faculty of Nobel Prize winner had this award for their breakthrough research than their outstanding teaching. However there is an attempted assumption that high quality researcher do excel in teaching, which may not necessarily be the case.

Research is measured in far more depth way than teaching. In way the over measurement of research strengthen the proposition that the most advanced countries in science and technology are also ranked top by their research universities for their excellence research. Perhaps the top research universities' performances on research output have direct impact to their advancement in science and technology.

The methodology employed for ranking is common across all continents, only to favour English speaking countries and universities (Levin and et al, 2006). Because they are likely to attract more students and a staffs than non-speaking countries do, as English is spoken by many countries. Universities where English is not medium of communication are at disadvantage. In addition to this, the use of academic peer review and citation all favour English language (Van Raan, 2005 a).

There is an attempt to give much weight to recent publication and achievement in all measurement. Be this as it may be, there is possibility of making citation and recitation of past work than recent work which again favor an already established university over new coming.

In THES ranking, the basic measurement for ranking is based on the following parameter:

1. *Academic peer review (composite score drawn from peer review of 9,386 respondent for 2009) 40%;*
2. *Research excellence (research performance is factored against research body) 20%;*
3. *Teaching excellence (ratio of faculty to students) 20%;*
4. *International faculty (international staffs as proportion of staff) 5%;*
5. *International students (international student as proportion of student body) 5%; Employer survey (scored on response to employer survey of 3, 281 respondent for 2009) 10%* (THES, 2009).

Peer review has been given the largest weight in THES ranking. The danger in using peer review lie in its prone to subjectivity. Besides, the use of peer review is likely to value

institutions based on their research reputation than teaching. Based on a combined study of SJT and THES ranking, the degree of internationalization measured by THES has little to do with the institution or academic performance (Steiner, 2010). Internationalization depends a lot on the geographic location and integration culture of the country. Further, the specific use of internationalization in the methodology, favour English-speaking countries. Also, faculty student ratio is weakly correlated with academic performance (ibid). Therefore, the attempt to measure teaching excellence from the standpoint of the ratio of faculty to students is not sound enough, as it lacks prediction ability.

The only similar measurement employed by both SJT and THES ranking is the citation index. Van Raan pointed out that citation index has technical and methodological problem. A) Technical problem; considerable technical errors occur during citation; author and authors' name as well as in recording article's name and book's volume and number. Another technical problem is with regard to attributing publication to institutions or department. B) Methodological problem; the citation index is problematic for certain discipline as the intensity of publication differs across fields. The US institutions are favored due to 'publication and citation traffic'; hence, big institutions are at the advantage position (Van Raan, 2005b).

In general, the two-world ranking differs in their methodology; nevertheless they both measure research than teaching, scientific advancement than transfer of it, teachers and students quality than management's quality, RU than typical undergraduate university. Therefore, the ranking table direct to the possible institutions one should look to so as to understand what strong research culture and community look like. This facilitates in identifying a possible institution to emulate as REU.

2.2.2 Research Excellence University

The Germans are credited for the creation Research University through often-referred [Humboldt Model] University of Berlin. The Humboldt's idea is that university should engage in character formation of a nation through scholarship; where there is unity of scholarship teaching and learning; and there should be solitude and freedom of researcher (Anderson, 2004). Later the rest of the world, arguably, adapted or adopted this model.

Particularly the US is attributed for further enriching the development of Research University and in the 20th century (Turner, 2001).

In discussing about Excellence University, often there is blurred image about similar other related adjectives that may turn up in one's mind. Among theses includes; "elite university" and "world class university". Elite Universities are engaged solely in the reproduction of elite of a nation and they are different from WCU. For instance unlike most WCU, French grande écoles and the US prestigious liberal arts colleges such as Williams and Vassar where known for their teaching excellence than research (Palfreyman and Tappler, 2009). On the contrary most WCUs are known for their excellence research out put, as it has been discussed in the previous part. Again WCU are considered elite university due to the position their graduates are securing in the society and also society's perception of these universities.

One may think that elitism is becoming history of the past, considering mass or universal higher education. However, elite reproductions are still persisting and probably continue in the future too, no matter how hard one try to abolish elitism from higher education system. Manuel Castel in discussing about the four-contradicting function of university (Ideological apparatus; selecting the dominant elite; generation of knowledge and reproduction of professional) has pointed out the fact that higher education is still engaged in elite production (Castell, 2001). It is not the national higher education system alone that is interested in the production of elite anyways. It is maintained by student preference, professional, government and international higher education in way of advancing research capacity and out put (Marginson , 2009).

Why all these bodies favour the continuation of elitism? Professionals have faith in elite institution, by virtue of being place for most talented staff and students. They believe, further the advancement of the profession would be in better hand in elite university than any other places. Complex processes involve in student choice of which university to attend to. Yet, almost exclusively students prefer being in elite institution. The present opt seen by many nations to have top ranked university is an evidence how governments are keen to the elite reproduction. The elite reproduction function of higher education system is most likely to be performed better by top ranked research university.

With out doubt, top ranked university produced well-qualified graduates, high quality research out put, highly innovative product and involve in transfer of technology (Salmi and Saroyan, 2007). These are the kinds of institutions that can exactly help build very competitive human capital of nation. By concentration of talent and resources in certain specific institutions of such a kind, elite institutions, quality of education and research shall be of the highest standard. They help in creating individuals with highest caliber capable of leading the various sectors of the nation.

In sum, Elite reproduction is welcome by large array of society. Building such university strengthens research capacity of nation and ultimately helps in promoting nations development agenda at large.

2.3 Research practice in Research University

The practice of research in RU is so immense that they even dare to claim the title 'Research University'. In this sub part of the study, Research universities' research practice in the light of disciplinary difference, knowledge and teaching shall be discussed.

There is some kind of research in every higher education as it is often taken for granted that teaching, research and community services are the main mission of higher education. However, when it comes to RU, there is greater emphasis on research by all party involved; student, academic staff, non-academic staff, government, any stakeholders one can think of. The underlining belief entrenched deep inside such an institution is research. Consequently, all resource and attention is diverted to the production of research.

The research undertaken in what is referred to as 'Research University' is quite different from 'non research university' specifically with respect to quantity and quality. In line with this treatment of RU, one can find the classification made by Carnegie; doctoral/ research university-extensive and doctoral /research university- intensive.

> *Doctoral/Research Universities - Extensive: These institutions typically offer a wide range of baccalaureate programmes, and they are committed to graduate education through the doctorate. During the period studied, they awarded fifty or more doctoral degrees per year across at least fifteen disciplines.*
> *Doctoral/Research Universities - Intensive: These institutions typically offer a wide range of baccalaureate programmes, and they are committed to graduate education through the doctorate. During the period studied, they awarded at least*

> *ten doctoral degrees per year across three or more disciplines, or at least twenty doctoral degrees per year overall*
> (Taylor, 2006: 4).

The Carnegie classification bases its criteria on how many PhD programs are offered in certain institution. In fact to offer a PhD program, university has to engage in more research, after all PhD is all about research.

2.3.1 What count as research?

In an attempt to identify as to what count as research, Griffith, made three reference points: 1) Systematic process of investigation; 2) Advancement of knowledge; 3) sharing with public (Griffith, 2004). Research is a systematised way of generating new knowledge to add up to an already existed one and at last making it available for public use. This definition is not vivid by itself. For instance what count as advancement in once sphere or what is new is still debatable. At the same time sharing the finding with public is also controversial as increasingly knowledge is being marketed especially in new knowledge production, Mode 2.

Continuing to the definition of research, the one usually employed word in the Organization for Economic Cooperation and Development (OECD) definition of 'Research' or rather classification of researches are: *Basic research*: it is theoretical or experimental work undertaken to acquire new knowledge, with out underlying practicality in view. *Strategic research*; it emanate from the basic research and where practical application in mind but with out specific area of application. *Applied research*; it is an investigation undertaken to gain new knowledge primarily towards practical aim or objectives (Bushaway, 2003). This definition has been borrowed and is in use in the European research league definition as well. In sum, it is difficult to have a simple all encompassing definition for research. However, the definition that 'research is systematic way of generating new knowledge' (Griffith, 2004) can serve as a definition for this study. Taking this definition of research in mind, the next section deals about research producer (researcher).

2.3.2 Who does research?

The most prominent research producers in RU include academic staffs, contract researchers and postgraduate students.

Contract researchers are among the key members of the staff. They perform more research than the regular academician (Bushaway, 2003). In addition to research, contract researchers help the university to collaborate with outsider and from partner to get research fund. Apart from their research output, contract researchers help in creating strong research culture through their interaction with regular academician and postgraduate students (ibid).

Another important knowledge producers in RU are postgraduate students that undertake education at masters and above level. They involve in actual production of knowledge in addition grasping research training.

Postgraduate studies were open to small elite who prefers to continue academic career until the middle age (Bushaway, 2003). Now it is more open than before and also employers are recruiting postgraduates as businesses are prospering. Graduates of such university are scarcely demanded by other universities and research organization. For instance, RU almost exclusively recruit their staffs from other RU by anticipating that graduates are excellent in their research output with out the appropriate consideration of their teaching performance, or perhaps automatically consider research performance predict teaching performance. Unfortunately, study did not confirm like wise (Hattie and Marsh, 2002).

Most important of all, academic staffs of RU are the foremost research producer. They are also responsible for integrating teaching and research. Unlike many other researchers (say enterprise researchers), university researchers' are motivated by the pursuit of knowledge for sake of the truth; and financial motivation, if at all to exist, is only secondary (Bushaway, 2003). There is an internal passion in doing research by the researcher him/ herself.

Often the internal passion of researcher is compromised. The researcher choose a theme to research up on, choose methodology to follow, do also follow predisposed school of thought etc. Nevertheless, the research practice do not entirely fall in the hands of the researcher, other factors do affect with what kind of research the researcher will end up doing eventually. In this regard, Bushaway, has identified activities and parties that do involve in shaping research such as; research funders, research and teaching relationship, external scrutiny (which may include the government, universities, public, business and industry) and academic peer groups (ibid). Researchers, in addition to their own convection and motivation, thus make compromise in their research practice.

On the other hand, institution's organizational set up has so much to offer for magnificent researcher's performance or otherwise. The determining factor for the quality (excellence) of out put in research is 'the quality of an institution's intellectual life' (Bennich-Björkman, 1997). Institutions' environment is major predictor for the achievement of excellence in research. The collection of individual academician who performs the actual research alone does not automatically lead to excellence. REU do have a suitable environment for quality research to flourish. This environment includes the right to pursue the truth on issues one is interested in, academic freedom.

According to the German definition, academic freedom is the right to teach, research and express oneself in public place in area where one has expertise. The US definition is broader in that it includes the right to express oneself even outside area of expertise (Altbach, 2006). Such environment is lacked especially in many developing countries. In these countries, academic freedom is severely restricted in knowledge areas that are considered politically or socially sensitive. Such fields include 'ethnic or religious studies, environmental research, and studies of social class or social conflict, among others' (Altbach, 2007).

Nonetheless, its importance to excellence research production is even substantiated by the fact that there are only few institutions that makes into the top of World University Ranking systematically while still violating academic freedom. And often argued it is the requirement for WCU (Altbach, 2009). Further the lack of academic freedom is one of the push factors for brain drain by making academician of least developing countries to look for it elsewhere (Altbach, 2004b).

2.3.3 Disciplinary difference and research

Academic disciplines are believed to be the organizing block of higher education (Clark, 1983). The importance of considering academic discipline while making analysis at macro, meso and micro level has also been suggested (Becher, 1994). Therefore, it is worth discussing disciplinary difference and its implication to research and researcher.

There are various studies that have been done to unravel the disciplinary differences: among these, Biglan and Kolb have identified disciplinary typology based on research engagement.

Biglan classified the disciplinary groups in to; Hard pure, soft pure, hard applied and soft applied (Biglan, 1973). Similarly, Kolb, made a distinction as; abstract reflective, concrete reflective, abstract active and concrete active (Kolb, 1981). Each respectively representing Natural Science, Social Science, Applied Natural Science and Applied Social Science.

As it is depicted in the table below different disciplinary groups show different cultural characteristics. *Hard pure* disciplines have universal knowledge domain and engaged in discovery or explanation of universal knowledge. Humanities and *soft pure* fields are committed to understanding or give meaning to particular phenomena. *Hard-applied* fields' knowledge resulted in new product or technique. *Soft applied* fields' knowledge are concerned with enhancement semi profession practice resulting in new protocol or procedure.

On the other hand high production rate dominate *pure hard* discipline as opposed to the case in *soft pure*. This high competitive research production is referred to as 'urban' (Becher, 1989). At the same time, earning patent substitute publication in *hard applied* field. Similarly consultancy services reduced publication rate in *applied soft* (ibid).

Becher also makes distinction called 'convergence' where there is a sense of shared identity among the research community against 'divergence' where the sense of shared identity is lacked. *Hard pure* discipline is good example for 'convergence' while *soft pure* is for 'divergent'. This help in understanding why certain fields (urban convergence) are privileged in terms of size of publication as well as fund (ibid).

Table 1: Knowledge and culture, by disciplinary grouping

Disciplinary grouping	Nature of knowledge	Nature of disciplinary culture
Pure science (e.g. Physics)'hard pure'	Cumulative; atomistic (crystalline/ tree like); concerned with universals, quantities, simplification; resulting in discovery/ explanation.	Competitive, gregarious; politically well organized; high publication rate; task oriented.
Humanities (e.g. History) and pure social science (anthropology): 'soft pure'	Reiterative; holistic (organic/river-like); concerned with particulars, qualities complication; resulting in understanding/ interpretation.	Individualistic, plurastic; loosely structured; low publication rate; person oriented.
Technologies (e.g. mechanical engineering) 'hard applied'	Purposive; pragmatic)know-how via hard knowledge);concerned with mastery of physical environment; resulting in product/ techniques.	Entrepreneurial, cosmopolitan; dominated by professional values; patents substitutable for publications; role oriented.
Applied social sciences (e.g. education) 'soft applied'	Functional; utilitarian (know-how via soft knowledge); concerned with enhancement of [semi-] professional practice; resulting in protocols/ procedures.	Outward looking; uncertain in status; dominated by intellectual fashions; publication rates reduced by consultances; power-oriented.

Sources: Becher, 1994 P. 154

Frequently, disciplinary boundaries are eluded as a result of collaboration among discipline. The most common forms of collaboration are: Interdisciplinary, multidisciplinary and transdisciplinary (Collin, 2009). Multidisciplinary; is formed when two or more discipline work together while staying in their respective discipline. Interdisciplinary; is a more integrated level aimed at unifying or create new discipline out of an existing two or more discipline (Schummer, 2004). Transdiscipline; goes beyond the traditional confinement of discipline to solving real life problem (Gibbon et al, 1994). In addition to this, disciplines are continuously specialized (Clark, 1983).

In the attempt to understand research, Brew, went as far as identifying how researcher experiences research. She comes up with four kind of research experience: *the domino variation*, where research is perceived as process of performing a set of tasks; *the trading variation* where research is experienced as product that can be traded; *the layer variation*, where research is all about discovering; lastly *the journey variation*, where research is

considered as part of the researchers personal development (Brew, 2001). These variations closely align to the discipline culture they are in. Knowing, how the researcher view research help in comprehending the existing research culture for further improving intellectual environment.

In general research practice is different across discipline and so are researchers experience of research. Furthermore, disciplinary boundaries are being diluted as well as getting ever specialized continuously in the face of solving practical problem or further advancement.

2.3.4 A new form of knowledge production

As seen in the previous part, it is important to remind once again that nature of knowledge varies across disciplinary classification. Knowledge is often classified as; a continuous *improvement, exploitation* of an already existing one and genuine *innovation*. All three are equally important but require different investment and in turn have different return. Knowledge is an economic resource and yet difficult to fully understand and formulate an economic theory (Gibbon et al 1994).

Scientific paper/ research produced in some sort of controlled environment where norms are strictly followed in terms of who, what and how to practice science. Along with this, now days, distinctive form of practice of knowledge production is emerging, Mode 2 against the traditional Mode1. In the word of Gibbons and his colleague 'Mode 1 refers to form of knowledge production- a complex of ideas, methods, value and norms-to be followed in compliance to what is considered as sound scientific practice' (Gibbons, 1984), It is performed to quench scientific curiosity (Griffith, 2004). 'Mode 1 is characterised by: disciplinary, homogeneity, hierarchical. In other word, Mode 1 knowledge production rarely leaves the conventional discipline and follows the strict scientific norms.

On the other hand, a new knowledge production referred to as Mode 2 is evolving now days. It is: transdisciplinary, hetrogienious and heterarchical'(Gibbons and et al, 1994). In Mode 2, diverse people engage to solve specific problem and knowledge is produced in the context of application and as such communicating results are very informal. Hard applied and soft applied field shares some of the attribute of Mode 2 Knowledge production but are not strictly the same (Gibbons, 1984).

Mode 1 precedes mode 2, and also both can exist together. 'Mode 2 has evolved out of disciplinary matrix of Mode 1 and continue to exist alongside it' (Gibbon et al, 1994:17). However, Mode 1 is key for the very existence of Mode 2. "Mode 2 knowledge production is endogenous to the practice of Mode 1" (ibid). It is continuous differentiation of disciplines and enormous graduate that helped the evolvement of Mode 2. Therefore, strengthening Mode 1 knowledge production is the first step before Mode 2 knowledge production in country where Mode 1 is a minimal. This means that strengthening the production of research in university, with all scientific norm and culture is prerequisite so that Mode 2 to flourish.

In close alignment to the argument for the necessity of university research, Geiger argued that university research are of superior for: - training function; due to the possible synergy of teaching and research; possible better autonomy of individual researcher; the already established critical evaluation, recognition and reward system as well as the dynamism of the university environment where new students and staffs strengthens excellence innovation (Geiger, 1985). He did mention that research outside the university is appropriate for big science; to achieve efficiency; to specialize beyond the curriculum at the cost of organizational hierarchy and bureaucracy (ibid).

2.3.5 Research and teaching nexus

In exploring the nexus between research and teaching, various studies have been conducted so far, though the findings are contradictory. There are three kinds of argument; those who argue the existence of strong positive relation between teaching and research, those who argue that research and teaching are negatively related and lastly those who argue that research has no relation of what so ever with teaching (Hattie and Marsh, 2002).

The first argument is in favour of research actually contribute to teaching due to the fact that; teachers who are active researcher know more about the subject matter and are always in close contact with the forefront science. Besides researcher also raise the excitement while presenting their research finding to students or clarify doubt from their own research in put. Research and teaching are positively related because they have common value –*rationality* (Braxton, 1996).

The second group came up with the findings that teaching and research are antagonistic or have negative relation. That they all require time and energy to spent to. Motivation and reward may be antagonistic as well (Marsh 1987). So research and teaching are competing activity rather than complimentary. There is no mutuality; in doing research, time for teaching is forgone. Barnett further argue that research and teaching are inherently incompatible that they sought different school, the graduate research and the undergraduate teaching schools (Barnett, 1992). Research and teaching task are quite different and in way that rather uncomplimentary.

The third group has argued that there is not at all a relation between teaching and research. The correlation between teaching quality and research productivity is zero and has been substantiated by the meta analysis of 58 articles made by Hattie and Marsh (Hattie and Marsh, 1996).

The argument about teaching and research nexus continues further in the light of disciplinary classification and their relative strength. Accordingly, Healy discussed the possibility of disciplinary difference in the nature of teaching-research link as some disciplines have a closer interaction while others lack. Based on the classification of the discipline's level of consensus, higher level of consensus to physical science and lower level of consensus to social science and even much lower level of consensus to humanities. Teaching and research relation was moderate in low consensus disciplines (social science) (0.22), smaller (.20) for humanities, and even by far smaller in high consensus discipline (0.05) Natural Science (Braxton and Hargens 1996). Thus, bringing teaching and research together is limited by their traditional discipline.

Further more, the level of program also determine the intensity of interaction between research and teaching. Postgraduate level teachings do have complementarities to research especially in hard science. In soft science and humanities even undergraduate education can have closer link to professor's research (Smeby, 2000).

Scholars are working to bring teaching and research together. For instance, Brew came up with the new model of teaching, research and scholarship as social process including scholarly community to bring teaching and research in way different than what was previously perceived as antagonistic (Brew, 2006). It is also important to note that the

production of teaching and research at the same institution has been sometimes justified for its efficiency (Nerlove 1972). Thus, the recent trend is trying to bring close collaboration of teaching and research.

In sum, bringing more closeness of teaching and research much enhanced or limited by the disciplinary difference and level of study. RU being a place of research and teaching should need to be cautious about level of study and discipline in bringing research and teaching closer. Also, research productions are not exclusively defined by discipline as increasingly multidisciplinary, interdisciplinary, and transdisciplinary researches are mushrooming.

2.4 Teaching and learning in Research University

The discussion about teaching always involves learning, while learning does not necessarily require teaching (Shulman, 2004). It is often argued that 'teaching and learning are basically related, that good teaching needs to be defined in terms of helping student learn…' (Prosser and Trigwell, 1999:11). In connection to this, Prosser and Trigwell have developed students' learning model as well as the corresponding teacher's experience of teaching model.

Student learning model is the interaction of student's prior experience, student's situation, student's perception of his/her situation, student's learning outcome and student's approach to learning. Likewise teacher's experience of teaching and learning is the blend of interaction of teacher's prior experience of teaching, teacher's perception of his or her situation, teacher's situation, teaching out come, and the teacher's approach to teaching (ibid). With this blends of experience both teachers and students choose their own approach of teaching and learning. The choices are: A) *Deep approach to learning*, where student aimed to understand ideas and seek meanings. B) *Surface approach to learning*, where student are instrumentally motivated and seek to meet the demand with minimum effort (Biggs, 1987 and Ramsden, 1992).

Correspondingly, teachers choose an approach of teaching either *Deep* or *Surface* that can be seen as the counter part of approach to learning chosen by student. Interestingly, students' choice of adopting specific learning approach is related to their perception of the learning environment (Ramsden, 1992), with which part of it is the strategy adopted by teacher. Yet, with in the same environment student may choose *Surface* or *Deep* approach to learning.

In the light of this model, RU is more likely to offer the best environment for teaching and learning for many reasons, just to mention few: First, the concentration of talent provides an attractive environment for student to learn outside classroom from peers, note that RU has the brightest student body. Second the teacher will more likely have a good perception that his/her students are talented. Besides, the teacher is likely to be highly knowledgeable, equally important in the perception of students that their teacher is highly knowledgeable. Hence, it is highly probable for both the teacher and the student to choose deep approach to learning. Study has proved that deep approaches to learning are more likely to be associated with high quality learning (ibid).

Taking the fact that RU is likely to focus more in research as discussed in the previous part and also given that the recent trend to forge close bond on teaching and research, an interaction of research and teaching is almost certain. Besides, the predominance of research in RU will ultimately affect the teaching learning process. To explain possible interaction of research in teaching, scholars have identified three typology of teaching; research lead, research oriented and research based teaching.

> *Research lead: where students learn about research findings, staffs research interests dominate the curriculum content, and information transmission is the main teaching mode.*
> *Research oriented: where students learn about research processes, the curriculum emphasizes as much the process by which knowledge is produced as learning knowledge that has been achieved, and staffs try to engender a research ethos through their teaching:*
> *Research based: where student learn as researchers, the curriculum is largely designed around inquiry-based activities, and the division of roles between teacher and student is minimized* (Griffths, 2004: 70).

In connection with teaching and learning in Research University, Shulman also formulated four possible models so that teaching and learning will have 'right and dignified' places with in RU (Shulman, 2004).

Model 1: the teaching academy as an interdisciplinary model: Before pursuing into the discussion of this model, it is important to take close attentions to two facts; the fact that teaching activity is often organized across discipline and that disciplinary boundaries matter most in teaching than research (Gibbon et al, 1994). Therefore, teaching and learning process differs across discipline. Nevertheless, these boundaries are being diluted as interdisciplinary

programs are run in parallel. As it draws scholars from various disciplines, it cannot sufficiently be located in single department or discipline.

Teachers are likely to be innovative in teaching at interdisciplinary center than in single discipline case, because there is no predisposed tradition. Academicians have 'dual citizenship in both the disciplinary department and interdisciplinary center' (Shulman, 2004). The limitation of interdisciplinary center is that the traditional faculty reward structure remains based on department so to speak discipline.

Model 2 : teaching academy as an aspect of graduate education;

This model cherishes the integration of teaching and learning with research in the early postgraduate education. In this way, postgraduate student will have an insight on their latter engagement of transferring their own and discipline's knowledge. This model brings together undergraduate and graduate education, teaching and research as well. Shulman further suggested using undergraduate education as site for innovation and experimentation for graduate students and pedagogy (ibid).

Model 3: the teaching academy organized around technology;

Teaching technology include the use of interactive technology, multimedia and Internet to support the teaching and learning activity. The advent of information technology has affected teaching and learning in many ways, it has: changed the way information is stored and accessed; enhanced student-learning experience through adaptive manipulation of the technology; improved feedback between academic staff and students; communication among academic staffs (Laurillard, 2000).

Inline with information technology, more often various multimedia are in use in curriculum to better store and accesses information. Its use in curriculum; has enabled student to understand more quickly than through conventional one, helped students develop and practice certain skills, and changed the way student understand (learner develop an image or mental construction that is far richer than an abstract verbal understanding), also enabled learner to move from concrete, specific example to general abstraction and vise versa (Bates and Poole, 20003).

Another product of information technology is the use of Internet in teaching and learning environment. It motivates and satisfies students at least as equally as that of the traditional one, better yet with 'positive overall learning experience' (Bekele, 2009).

Thus, the integrating technology in the teaching and learning arena is another possible model of teaching and learning. Shulman argued the addition of technology in the intersection of teaching and learning to enhance effectiveness.

Model 4: the distributed teaching academy

In this model he argued in favor of having different sets of teaching and learning that are initiated by the locals, not 'institutionalized', but supported institutionally. These local efforts, in turn, support initiatives that may grow into source of strength for the whole institution. Though he did mention that the four models are not exhaustive, they show the research universities teaching and learning milieu. Most importantly, he did indicate that one of the model or mix of two or more models and/or the possible development of other models can be found in RU.

2.5 Management and Leadership in Research University

Among areas that may help understand RU is to look at the way they manage their chores, cultivate their leader or administer their resources. Several higher education scholars have identified peculiarity of management of RU, this part serve the purpose of revealing those peculiarity. In addition, the discussion includes academic staffs and students recruitment.

Taylor has identified set of common requirement of RU management based on the discussion on six top research universities. These are: Speed response, flexibility, critical mass, interdisciplinary research, devolved responsibility, strong leadership, effective management and coordination (Taylor, 2006). The characteristics show the manifestation of a belief that strong management body has directed the institution to such prestige. From this finding it is possible to infer that prestige and success comes by the very will full act of the management (academician and non academician).

Taylor also suggested that the collegial model of management is no longer appropriate for modern RU (ibid). Strong leadership is required and together with devolved responsibility.

Such kinds of requirements better meet by flat organization, where there is less hierarchy. This is also in line with Birnbaum findings, where he found that horizontal differentiation (decentralized, flat organization group structure) was significant predictor of research productivity (Birnbaum, 1983a).

Kerr argue in favour of participatory leadership at RU. He further argued why it is the most effective by pointing out the reason that; knowledge is too extensive for single leader to comprehend; for it raise the self-esteem of researcher; for an all-rounded knowledgeable single leader does not exist; for it help in adding opportunity to focus on problem at hand and finally allow subordinate in gaining information to contribute more (Kerr, 1984).

The academic staffs are the principal staff of RU. They are primarily engaged in research and teaching. In addition to this some may have other duties of being research group leader or senior administrative body of research. These are often referred to as research champion. Research champions are those individual responsible for leading specific research project, research unit or research centres. Successful RU has lots of such individual, who can successfully lead the research activity. These individuals are often highly successful in their field of research, highly respected by their immediate, national and international colleagues. It is their high reputation in addition to leadership skill that helps them in organizing researcher and form research group.

Research group usually consists of external partner, senior researcher, contract researcher, international academic colleague, and postgraduate research students (Bushaway, 2003: 147). In any case, it is important to notice that an individual's involvement in research leadership means an equally less engagement in that specific research for the leader, more of coordinating function.

Bushaway also mentioned that senior researchers do often involved in top management of the university at large, where research is a major but not an only part of the universities activity. This seems destruction from the basic function of research for the particular researcher, yet it plays a paramount role for institution to go ahead in the direction of gaining excellence. This is because, it cultivate research leaders who are committed to excellence.

Another important personnel in the management of RU are research managers. They are professional managers who take care of the daily responsibility of research programs. These daily activity involves; financial management, logistics, infrastructure, human resource issues, quality assurance, project management, networking, marketing and promotion, sponsor management, liaison with the university management, liaison with research services, partnership and link management, international collaboration, organization, administration and media relationship (ibid: 149). Professionalizing the management of university is believed to strengthen institutions response to competition nationally and internationally (Maassen and Cloete, 2002), just like what a RU believed to be operating.

Bland and Ruffin in discussing about the characteristics of productive research environment have discovered, based on the discussion from various literature, two areas- *personal characteristics* (personal motivation research training, mentors, early scholar habits, socialization to academic values, network of productive colleague, resource and substantial uninterrupted time)- and *environmental characteristics* leading to suitable environment for production of research (Bland and Ruffin, 1992). Most importantly, they have discovered that leadership is the one variable that is affecting all other organizational characteristics. At the same time, the leaders of RU supposed to be highly skilled scientist so that other fellow scientist can perceive him/her as leader (Drew, 1985).

In general, research leaders are as equally important as researcher in bringing success to Research University. Therefore, due attention is needed in identifying research champion for the continuation of further reproduction of research. RU needs to continuously maintain talented staffs and students. Also a flat, decentralized organization structure has been suggested to suit RU. The next part deals with recruiting and maintaining the talent pool.

2.5.1 Academic Staffs and students recruitment in Research University

Human resource stands second to finance as the most important area of Higher education management, in the eyes of senior higher education managers (Crosthwaite and Warner, 1995). The finding is not surprise, rather, it is a proof of once again that higher education is a labor-intensive organization and therefore, requires greater caution in treating personnel.

Most important of all, with the value and commitment to excellence, RU requires the recruitment of the brightest academic staffs by all means. Experience from nations with top ranked research universities have shown that their staffs are of collection of stars. This is further maintained through an easy mobility of staffs from other less ranked national institutions apart from international recruitment.

Broadly, student enrollment can be of two kinds; centralized and decentralized. In the former case the decision of enrollment lie in the central government, while the latter case the decision is in the hands of each institutions. REU in exceptional way requires talented individuals and hence, selectivity is bold characteristics. In fact high correlation exist between selectivity and university ranking (CHEPS-Center for Higher Education Policy studies, 2002).

The usual practice to select undergraduate student is through making use of standard test and transcript for screening and latter bringing additional criteria. High school ranking and national exam result narrow downs the pool from which top college selects students (Bial and Rodriguez, 2007). Thereafter, institutions may use other specific admission criteria.

'Many admission practices include a review of extracurricular activities, personal essays, individual interviews, and school involvement, but there have been no ideally used, validated tools or standardized program models that can screen for or measure non-cognitive trait with any reliability' (Bial and Rodriguez, 2007). This forces institution to use narrow measurements like exam results. The use of exam also makes cost of admission to be minimum.

The real challenge is not only in identifying the able student but also in attaining diversity. Top scoring students are most likely to come from the privileged and rich parents, which will be challenge to address the issue of equal opportunity. Besides, research has found that grades are poor predictor of career achievement and earning (Bowen and Bok, 1998). In way also send message that other personality traits like communication and leadership, which cannot be exactly seen by exam are also equally important.

2.6 Stakeholder's relationship in Research University

Higher education system by itself is with in a system that consists of various parties at different level. These levels may be global or international, national and institutional (Maassen and Cloete , 2002). Global level actors includes international multilateral organization, universities found abroad etc. National level actors include; national universities, buffer bodies involved in scrutinizing the activities of universities, various federal and regional government offices, and business organizations. Institutional level may include former and present students, staffs, immediate communities, and business clients. With this system in mind as well as various actors (also referred to as stakeholders), interaction is almost always inevitable.

The kind of interaction that higher education institutions have with their stakeholders varies. Sometimes, the relation is formed based on certain guidelines that are set by law where institutions are supposed to follow. At times it emanate from common will among institutions and stakeholders. Institutions may also initiate some interactions, while others are created spontaneously.

The very existence of theses stakeholders shapes the activity of university. This may go both ways in that university may influence and at the same time be influenced. Stakeholders are needed as an additional source of income by selling service or receiving donation from. Further, their importance is signified by the fact that they serve as future employer of graduates or partner of research.

More often it is argued that higher education institution has 'third mission', community service. A community service is an embedded activity in all higher education institution; every higher education institutions claim to serve the community. This helps in legitimizing the very existence of higher education, which in turn help in appealing for funds and collaboration. Hence, universities collaborate with industry and business organization is one means to reach to society. Traditionally this collaboration was weak. However, recent trend directed into bringing government into the picture making it a tripartite, best known as triple helix.

The triple helix model is a model that shows the new relationship among higher education, industry and the state. The relation has changed from what has been the case of industry and

academics being under the roof of the state to triadic relationships. The triple helix of university, industry and government relation is becoming more flexible overlapping system, with each playing the role of the other.

> *Bilateral government-industry and university-industry ties have expanded into trilateral relationships at the regional, national and multinational levels. Encouraged by government, universities have become a key element in innovation policies throughout the world, as a source of technology for both start-up firms and older companies* (Etzkowitz and leydesdorff, 1998 P. 207).

The triple helix thesis holds that universities take the lead in innovation and future economic and social development from the firms (Etzkowitz and Zhou,2006).

Here, RU partnership with industry has multiple benefits. It can be source of income as research contract. By sharing academic knowledge and industrial talent, it also makes easy the transfer of research into product or company. Most importantly, it creates a better ground to integrate entrepreneurial ethos and caliber into the university.

2.7 Resources and Research University

If there is a particular move common by all nations in the way of creating excellent research universities, it is the large amount of money they spent. For instance, while, Germany put $ 2.8 billion (Baty, 2009), Saudi Arabia forwarded $3 billion for excellence initiatives (Sharma, 2009). This figures show, how much capital demanding excellence initiatives and REU are. On the other hand, higher education institutions have never said enough when it comes to resource and they always ask for more. In line with this, the famous Bowen's law, 'the fact that universities will raise all the money and spend all the money they raise' (Massy, 1996). In Prestige research universities this effort to raise and spend are many folds.

Research universities require large amount of money to support high standard of teaching and research. Most importantly, as research in especially *hard applied and hard pure* disciplines requires large amount of investment in infrastructures like laboratory, running RU is very expensive. RU needed to raise huge amount of money from both public and private sources. Private funding includes tuition, private contract and endowment. Public funding is also the most common fund for higher education and it is from the government purse.

Tuition fee collected from student is private source of income for higher education. Considering most of RU of the US and UK are private, the tuition fees is nothing compared to the education spending per individual per year (Jongbloed, 2006).

Therefore, charging student more does not help either as it is way behind the expenditure, not to mention that the most able individual may not get the chance to pursue their education, as tuition may not be affordable. It is necessary to look for alternative source of fund. Business contract provide an alternative source in that higher education institutions sells their knowledge, through consultation, research or patent.

Another important source of the private source of income is endowment. In fact Winston expressed that donative wealth is the source for institutions hierarchy (Winston, 1996). Prestigious institution has lots of accumulative donation. There is culture of people endowing to higher education at least in western society. Together with endowment the other common kind of funding is alumni contribution. In general, the US and UK have better culture of philanthropic (Higher education finance, 2004; CHEPS, 2002).

Public fund can be classified based on what is funded. It can be made available either for input or output or mixture of the two. Input based funding relay on the number of students that are enrolled. While output based funding bases the output of teaching and research. Public money can also be made available either through block grant or line item budgeting (Massy, 1996). Block grant is favoured for it help in undertaking long-term project and also in cross-disciplinary project (Higher education finance, 2004).

Public funding can be made available to cover both teaching and research activities as in the case of Germany, Switzerland and UK (Herbst ,2007). Research and teaching can also be funded separately like in the case of US. Separate funding scheme help senior researcher and also reward merit, though it harm junior faculty, as it is difficult for juniors to break through and get funded. Further more, it will be difficult to undertake risky research if the fund is separated (ibid ,2007). Therefore, a mix of separate and an aggregate funding is appropriate.

Chapter III: CONCEPTUAL FRAMEWORK

This part is dedicated to constructing a framework so that smooth data collection and analysis can be made. Accordingly, various theories and concepts about differentiation and possible way of differentiating an institution will be explored. Further, the part shade light on relevant themes that are fundamental building block of RU.

As it is depicted in the literature review part above, a different kind of institution known as REU exists. Creating such university in Ethiopia is the underline thrust of this study. Theory of Differentiation provides reason for why elite and mass higher education exist side by side in system. Besides, it explains how a different kind of institutions like that of REU came into existence. Consequently, exploring theoretical ground of differentiation has paramount relevance.

Birnbaum argue that differentiation system is desirable among other thing a differentiated system: help in meeting diversified needs of students, employers and political parties' interest and expectation; it allows the co-existence of mass and elite system; further it is believed that a differentiated system ease social mobility. It also helps in experimenting policy in part of the system; most importantly, differentiated system is thought to make the system efficient and effective (Birnbaum, 1983b).

In the attempt to capture differentiation, Clark, come up with the concept of classifying it as; *section* (horizontal) and *tiers* (vertical) with in institution; *sector*(horizontal) and *hierarchies*(vertical) among institutions (Clark, 1983). Particularly, it is relevant to look at the two types of differentiation with in the system (among institutions). First is vertical differentiation that is the hierarchical differentiation of higher education institution with in the system. Second one is horizontal differentiation that is the expansion of similar status but different institution in the system (World Bank 2000:28). The next part shall continue to deal about such differentiation.

3.1 How differentiation and diversification is formed?

Kyvik forwarded two theories to explain why differentiation and diversification happen in higher education. First one is *structural-functional theory*; based on this theory differentiation is created as a result of the need of the society. It is the outcome of division of labor and specialization. Second theoretical explanation is that differentiation is '*drift of ideas'*. In other word, differentiation and diversification is result of similar structure imitated from perceived successful programs of another country. He also conveys that institution's need, interest and value of key actors are major source of differentiation in system (Kyvik, 2009).

Similarly, Vught has showed that the occurrence of differentiation and dedifferentiation has to be explained by blend of internal organization behavior and external environmental condition. He arrived at this explanation based on the assumption that organization exist in an open system, where input is received from and output is produced for the environment; in order to survive higher education organization need to secure a continuous and sufficient supply resources; and as resources are scarce higher education organizations compete with each other, and lastly they can both influence and be influenced by their environment condition. Therefore, differentiation and diversification occur as result of organizations internal behavior and external environment's condition (Vught, 2007).

Parallel to the discussion ahead, Kogan has identified a set of means of creating differentiation. One way of creating differentiation is by appealing to quality. For instance, a highly prestigious university is believed to be of exceptionally of high quality. Government does also reinforce differentiation through funding mechanism. The US Ivy league, Cambridge and Oxford in the UK receive more funds than many other institution combined (Palfreyman and Tapper 2009).

Diversification in the US higher education system is especially brought by separation of Graduate school with the concentration of research. It is argued that the divide between teaching and research is another source of differentiation. Further differentiation is achieved by institutions purposeful act of student selection.

Academic staffs do also serve as source of differentiation when they do join perceived prestigious institution as a result of their extraordinary achievement. Lastly, institution creates

differentiation by building self-image to the institutions. This can be depicted in their mission statement, student selection, expenditure and their interaction with external stakeholders (Kogan, 1997). Thus, it is possible to conclude that differentiation can be created in higher education by appealing to quality, student and staffs selection, separation of the management of teaching and research activities and through finance. These are blend act of internal organization activity and external resource and condition.

Differentiation is not the last thing to occur, there is dedifferentiation. It happens when a differentiated institutions face the same environment or homogenous external environment (Vught, 2007). Institutions tend to look alike, as consequence of facing the same kind of environment, institutional isomorphism (DiMaggio and Powell, 1984). Institutional isomorphism is a theory that states institutions end up being similar in spite of each organization's attempt to be different so as take advantage over getting the scarce resources.

Institutional isomorphism can be formed in three different ways; *Coercive isomorphism*, where similarity is maintained by law; *mimic isomorphism*, where several organizations attempt to imitate other which will in turn resulted in imitating successful model organization; lastly *normative Isomorphism*, where professionals reinforce homogeneity of organization by virtue of being from the same profession (DiMaggio and Powell, 1984). With respect to the last one, Vught has also described that greater influence of academic norms and value reduces diversity in higher education (Vught, 2007). In addition, institution's degree of diversity is reduced by government regulation (especially quality control schemes)(Maassen and Potman, 1990).

It is important to bear in mind that higher education institutions can undergo institutional isomorphism in all three ways. This is a clear evidence at least theoretically that once excellence University is created and nurtured, others will followed suit to be identified as RU and hence there is good chance for the entire system to embrace excellence.

3.2 Essential building block for Research Excellence University

Following the discussion from the literature, theoretically, it is possible for WCU to be excellent only in teaching and learning with out enjoying research excellence. Better yet,

there is a growing consensus that REU do closely resemble WCU. Hence, looking into the framework how WCU are created is relevant. First and foremost distinction is required between RU and WCU. RU is the base to eventually evolve into WCU or REU. Therefore, looking into RU too is relevant.

Scholars have identified what a RU looks like. According Taylor key characteristics of leading RU includes: Presence of pure and applied research; Delivery of research-lead teaching; Breadth of academic discipline; High proportion postgraduate research programs; High level of external income and International perspectives (Taylor, 2006). Furthermore, Altbach identified that in most cases RUs are: funded by government, multiversity, resource intensive and also attract the "best and the brightest" (Altbach, 2007). With such characteristics, no wonder that most research universities are found in developed countries than developing countries.

Coming to creating an altogether WCU, Salmi provides three frame work for building world Class University: *High concentration of talent*; *Abundant resources* and *Favorable government* (Salmi, 2009). The same way, Altbach discuss the framework for building world-class university as combination of *resources* and *condition* required. These are: Sustainable financial support; development of clearly differentiated academic system; managerial reform and the introduction of effective administration and lastly a condition to have truly meritocratic hiring and promotion policy (Altbach, 2007).

Finance is a crucial ingredient for RU. It is necessary to attract talented academician and talented students. The finance has to be also sustainable. With sustainable financial resources, scholarly activities are supposed to takes place to the highest standard. This in turns leads to look into what is going on inside the institution, teaching and research is particularly relevant. In addition, it is worth to discuss about governance, as RU's management can partly explain the success of REU. Creating REU also partly depend on students, as it depends with academic staffs. Hence, staff and students recruitment activity plays key role.

Lastly, the discussion of creating REU would mean nothing with out actually connecting it to the community and the nation at large. Therefore, exploring the possible area of connecting universities knowledge out put to the business is an indispensable task.

The creation of REU can be depicted in simple model of input, process and output. In practical world however things are not as linear as it looks like in the figure, there are many turning and twisting. Therefore, it is very simple representation of the actual world.

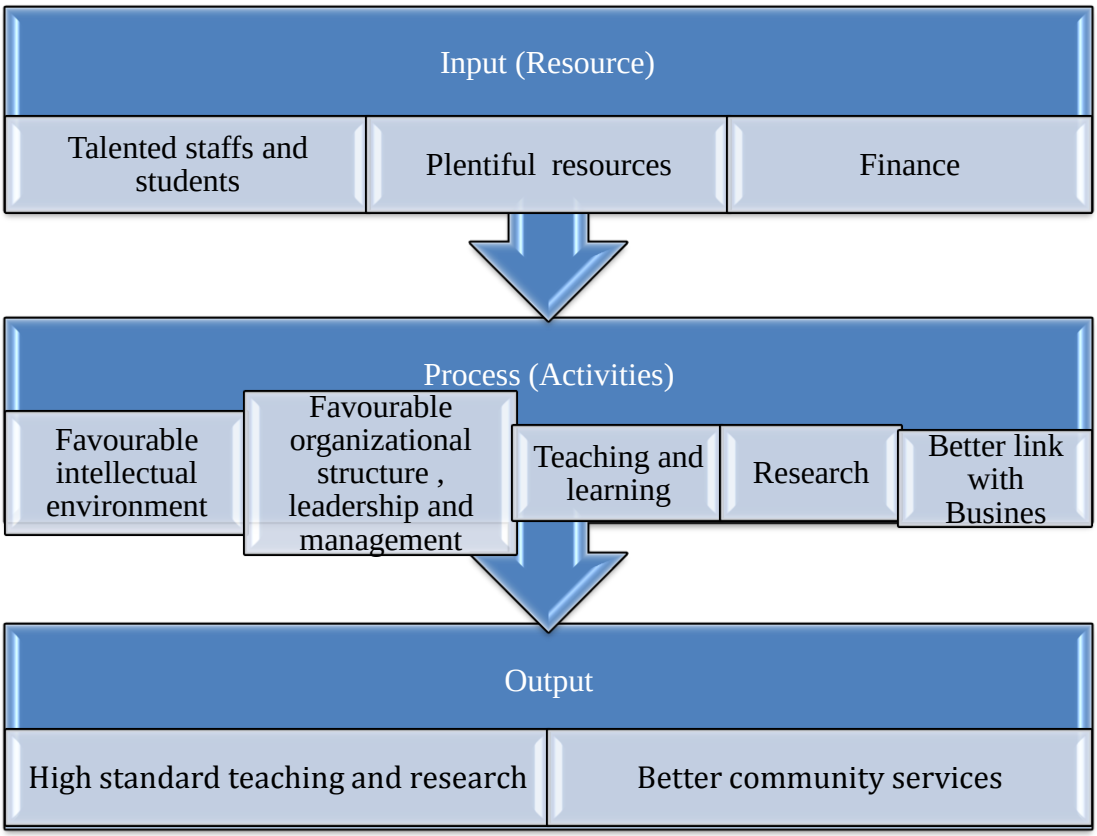


Figure 1: Illustration of input, process and out put of REU
Source: Own construction based on the literature

So what can be expected of REU to look like? First, in terms of input, resource being abundant to finance vast research activity, high standard staffs, pool of bright students, develop and maintain infrastructure. Second, with respect to the process; research universities are supposed to be endowed with intellectually suitable environment where teaching, learning and research are taking place at the highest standard. They also have better communication with industry and government alike. Most importantly, the management is supportive of innovation. Third, graduate of RU are supposed to be of highly qualified, partly due to the extreme admission criteria and partly, of the intellectual life on campus. They are also supposed to produce innovative research out put.

In building world-class university, scholars (Salmi 2009; Altbach, 2004 a) have warranted a caution due to the tremendous amount of capital required and also respecting for fulfillment of other social needs. Thus, nations should be realistic in their move to have world-class university. Every country should not necessarily have to strive to have world-class university. Yet, the expensiveness of world class or REU should not foresight one from having it and reaps the possible future benefit. In the word of Muchie 'The absence of research universities hinder the development process as much as it increase the dependency on high level and specialized skills held by foreign expensive expert that come and go with perhaps not to be embeddable and sustainable skill and knowledge in the poor countries' (Muchie, 2008).

Developing countries can build excellent university of their own taking the question of the league or ranking table aside (Salmi, 2009). Hence, the ranking table can be used in identifying Excellence University. Adopting excellent university's model and good practice doesn't harm developing countries provided that the intention is free from the ranking race, at least for the moment. In other word, it is probably a good idea not let the intention of creating excellent university be carried away by mere immediate competition. As getting into competition to step up in the ranking ladder will have devastating effect. It is better that the emulated institution be Flagship University of once own nation.

Finally, it is important to bring into the attention that the International experience have shown so far that there are three ways of creating the so called 'world-lass university', which can equally be seen as REU of nation as discussed earlier. These are, through either upgrading an existing one or merging two or more existing universities or building new one from scratch (Salmi, 2009).

The discussion about building REU could follow the thematic line of modeling the practice of research, teaching and learning and management. In addition, resource, academic staff and student are supplementary structural ingredient.

Chapter IV: RESEARCH DESIGN

In this part, the methods employed in the study will be presented. The part also argues the reason behind choosing specific methodology. As it has been constantly referred, the study deals on how to create REU. It can be approached by both quantitative and qualitative study. Quantitative methods usually used to test hypothesis or provide an empirical account of phenomena. It can also be used for analysis of casual relationship between variables (Denzin and Lincoln, 2000).

On the other hand, qualitative study provides: a)'holistic' account of the phenomena b) an opportunity to include the context in which things happen c) a suitable condition for exploring little-understood phenomena as Creswell described it 'We use qualitative to develop theories when partial or inadequate theories exist for certain population and samples or existing theories do not adequately capture the complexity of the problem we are examining' (Creswell, 2007).

At the same time, the specificity of this study includes that: A) little is known about REU for which to base theory. B) REU is contextually new to Ethiopian higher education system. C) This specific study has no intention of proving an established hypothesis or analyzes casual relationship using quantitative data. D) Lastly, short time and finance are at the researher's disposal for not including quantitative study. Hence, qualitative study suits best to this study.

The qualitative study has been approached through case study, where documents of selected case universities are analysed to understand distinctive behaviour of REU. This being broad choice of fundamental methodology, the next section deals with practical rationale behind sample selection, data gathering and analysis.

4.1 Sample case university selection

Looking into the US and UK education system is a necessity by many standard for one who is interested to build REU. For one thing, as it has been identified in the previous part that majority of world top RUs are in USA and UK, taking the fact that the two major World

University ranking SJT and THES. Further more, the proposition is strengthened by Marginson's description of the two systems:

> *The US and UK higher education system is so successful primarily for four main reasons namely, due to the fact that: 1) the system binds together elite and mass higher education, 2) teaching and research is integrated, 3) the greater diversity help in excelling in multiple areas 4) have good mode of governance* (Marginson, 2006).

To this end, four universities from the two most dominant higher education systems in terms of quality of RU have been identified.

The sample is based on purposive sampling (Stake 2000), where the purpose behind selection of the sample is not theoretically defined. However, it has purpose of representing the US and UK top institutions where an attempt has also been made to include one public institution.
Base for selection of case study universities are:

1. Being top in both SJT and THES ranking. These two ranking are prominent among scholars and politicians. Among other things, they measure quality of research out put, teaching quality, staffs' quality, level of internationalization and so on.
2. Include at least one public university. This is a criterion specifically added so that a public account of RU can be explored, as there are very few top ranked public universities.
3. Have better research performance. As discussed before boosting research performance and excellence should be the basic idea behind REU. This criterion is required because with in the ranking itself the overall weight is undermined due to some other parameters. In that case research excellence should be prioritized.

The most recent ranking table shall be taken to get the most contemporary track of record. Most notably, since the introduction of the ranking is recent phenomena, competition is getting tougher as well as the latter measurement are getting more compelling than the previous and this way the most recent ranking table is likely to identify the most enduring excellence university. Based on the 2009 ranking of both SJT and THES the following table is prepared.

Table 2: Combined ranking of SJT and THES for the four selected case universities.

Rankings 2009	University of Cambridge	University of Oxford	Harvard University	University of California, Berkeley
SJT World ranking	4	10	1	3
SJT National ranking	1	2	1	3
THES World ranking	2	5	1	39
THES National ranking	1	2	1	19

Sources: SJT and THES ranking

Based on their national standing, the only institution which arguably exceptional in this ranking is University of California Berkeley,UCB. Including UCB in this study is interesting as it is the top highly rated public university in SJT, and the other reason is even if it is low rated in THES. It has got the lowest ranking in THES due to *international score (25%)* and *Staff/ students* ratio (34%), do in fact say little about the research performance of institution. On the contrary, the institution has got 100% rating for peer review, employer review and citation index. The low rating in staff/ student ratio can solely attributed to the fact that it is public university. The mix of the case study shall be with 3 private and 1 public universities.

As this study is intended to explore and come up with a practical emulated university of a similar kind, including an Ethiopian reality is essential. Therefore, system level description of the Ethiopian Higher education is included in way to have contextual ground. With respect to case university from Ethiopian part the researcher encounter to challenge as there is no 'research university' per se. Hence, there is no particular population or sample to include as part of this study. However, presenting Addis Ababa University will show institutional reality of Ethiopian University. It is chosen because, it is the oldest university that currently offers more PhD program than any other institution in the country (MOE, 2009). Further, the university is in the verge of becoming RU.

4.2 Data gathering

This study is a qualitative research and based its data entirely on documents. It is almost impossible to go back and forth among three countries involved in this study time wise as

well as financial wise. Accordingly, the content of the various documents has been analysed to understand basic characteristics.

Particularly, the study has accessed data from official websites of; case universities, case country's higher education statistical figures, the two world rankings, and several higher educations think thank. The document has been used to grasp a depth understanding of case study universities as well as national system internal function. These documents includes: universities own studies, universities facts and figures, universities internal report specifically addressing issues and themes of interest, and countries official facts and figures. Data about the characteristics and operation of the case study universities shall be uncovered from these diverse documents. The limitation on the document is that actual activity may not be recorded; effort has been made to gain the actual recorded activities by cross-referencing data gathered for various internal studies.

4.3 Analysis

As documents are the only source of this study, content analysis has been adopted to arrive at major findings. Content analysis helps to examine data with out affecting the object to be studied (Babbie, 2007). In this case, the documents used in this study are recorded way before this study and it cannot be affected by this study. It is also very reliable (ibid).

Creswell suggested analyzing cases study through description of cases and looking for a correspondence between two or more categories (Creswell, 2007), in this respect case universities' themes. Similarly, it is suggested to analyze themes of each cases as well as analyzing cross case themes (Gomm et al, 2000). Accordingly, after each case has been presented, theme wise case analysis follows and at last cross case themes analysis will be done. This makes easy to establish patterns of characteristics of institutions (ibid). The themes are research, teaching and learning, finance, industrial relation, organizational structure, and staffs and students recruitments.

Chapter V: RESEARCH CONTEXT

As this study is intended in exploring REU in order to create a similar one in Ethiopia, knowing where the country stands on its higher education is essential. In this part, the research context shall be presented by describing the most fundamental reality of Ethiopian higher education. It is structured in this way: the first part introduces the country Ethiopia in general. Then, follows presentation on specific realities of the Ethiopian education, higher education, staffs and research production. Lastly, the recent trend and prospect in pursuing excellence is highlighted.

5.1 Back ground

Ethiopia, which is located in the northeast part of African continent, is one of the oldest civilized nations in the world. Its population was around 74 million in the year 2007(Central Statistics Agency, 2007). "Cradles of mankind" and "melting pot" are some of the reference that scholars attributed to Ethiopia for its home for more than 70 diverse ethnic populations.

A federal administration is in place with 9 region and two administrative cities that more or less bases ethnicity. The annual average growth rate of population for the last decade was 2.6%(CSA, 2007). Ethiopia is also endowed with young population with 51.9% being with age range of 15-64 and around 45% being below the age of 15. Besides, based on the 2007 census, around 84% of the population resides in rural.

The Ethiopian economy is predominantly depends on agriculture for it contributes around 44% to the Gross Domestic Product (World Bank, 2010 a) by employing 85% of the total employment and 80% of Ethiopia's commodity export earnings (World Bank, 2002 b). With Gross national income per capita of $280, Ethiopia is one of the poorest nations in the world. The country stands bottom in living standard with 0.414 Human Development Indexes (Human Development Report, 2009). It is also important to notice that the last couple of years Ethiopian Economy have shown a tremendous growth of an annual average of 8-10%(World Bank, 2010 b).

5.2 Education in Ethiopia

It has been little over century since modern education is introduced to Ethiopia and yet major expansion in the sector has happened only recent decades. Even now it has not reached to a satisfactory level, for instance, in 2007 the combined gross enrolment in primary, secondary and tertiary education was only 49% (Human Development Report, 2009). This is even worse when it comes to higher education where the gross enrolment ratio of 2.7 percent (World Bank, 2009). It is by far less compared to sub Saharan African average of 5 percent (UNESCO, 2010).

Total enrollment in higher education institutions in 2007/08 (for 61 reporting institutions- to education statistics) was 270,356 in all programs including: Regular, Evening, summer and Distance for both Government and non-Government institutions. The non-government enrollment accounts for 18.1% of the total (MOE, 2009). The private institution sector serves in filling the un-meet demand in access, apart from that it is characterized as small and often family-owned venture (Nwuke, 2008).

At the present there are 22 government institutions, which are about to be raised by around half percent by next year or so with promised 10 new universities (MOE, 2010). There is no doubt that the higher education sector is growing at faster pace; however, there is doubt about whether this expansion isn't at the cost of quality and excellence. Already there are sign in that the institutional infrastructure is poorly equipped; classrooms, workshops libraries and laboratory equipments are of poor standard (Amare, 2005).

It is also worthy to note that the Ethiopian system of qualification structure are BA/BSc (3 years), MA/Msc(BA/BSc+2 years) and PhD(MA/MSc+3years). In line with this, an intermediate qualification in between the existing qualification pyramid has been suggested (Ashcorft, 2005).

Some observers also pointed out the prevalence of Poor management and leadership in Ethiopian higher education system. 'It has been attributed, among others, 'to poor resource mobilization, to high unit costs, poor supervision, misuse of personnel, inappropriate resource utilization, and the absence of an information system and organized management' (Yizengaw, 2003).

5.3 Ethiopian Higher Education Proclamation

The Ethiopian higher education system is governed by proclamation issued specifically addressing pertinent broad issues such as establishment, finance and management structure and also proclaims guiding value and responsibility for every one involved. For this reason looking at the recent two proclamations, HE 351/2003 and HE 650/2009, is pertinent because it will provide a clear picture of reform and it will help in understanding the underlining intention and vision behind the reforms. Hence, it provides another perspective in developing Model REU.

The Ethiopian higher education proclamation on 2003 has given a legal ground for the establishment of two particular offices called the Higher Education Strategy Center (HESC) and the Ethiopian Higher Education Quality and Relevance Agency (HERQA) (Ethiopian Higher Education Proclamation, 2003). While the former has a mandate to perform higher education structural reform that could be compatible to the international system and internal reality, the latter has responsibility of accrediting quality of higher education institutions. These two bodies are autonomous in their sphere and as such can be considered as buffer body between the Ministry and institutions.

Based on the proclamation HE 650/2009, the Ethiopian higher education has mission to promote democratic culture, fairness and equity additional to the obvious mission teaching, research and community service (Ethiopian Higher education proclamation, 2009). According to the proclamation, it is only the Ministry of Education that grants institution a university status. In order to get the title, institution need to meet certain standards in terms of size of student body, mix of discipline and stated mission.

The ministry of education involves in 'coordinating' and sometimes to the level of 'interfering' into curriculum of programs. However, there are few duties in relative term that are left at the discretion of the university, duties like opening and closing down of programs, though practically it may takes years to do so. The community out reach function of university has been also left for the institution to decide. The research mission of the system underlines technology transfer, at least it is stated in the proclamation. It entirely bases on addressing country's issues of area of priority and development.

The proclamation also grants academic freedom on the pursuit of institution's mission consistent to international good practice. However, the ground reality is far from embracing this. For instance, Ethiopia is often referred as a country that severely represses academic freedom (Altbach, 2006, Saint, 2004). A study also confirmed that most of the UNESCO recommendations on academic freedom are not observed in Ethiopia, including the right for teachers to form association (Semela, 2007). The reason is partly due to the past history of summarily firing of professors and suppression of student's demonstration (Altbach, 2006) that staffs and students are reluctant to exercise the now freedom granted in the proclamation (Saint, 2004) or perhaps skeptical about its existence.

The Federal Government in form of block grant substantially funds Ethiopian public universities. The block grant allows institutions autonomy in the use of the fund. The proclamation have also extended the possibility of the university to own a business entity which the initial capital can be secured from government for university's future use of its net profit. Further under the new proclamation, public institution signs a strategic plan for five years with the ministry of education that will ensure how the five years fund will be used. The proclamations also state that institutions are autonomous with respect to managing their academic units, recruiting staffs and most notably in managing finance.

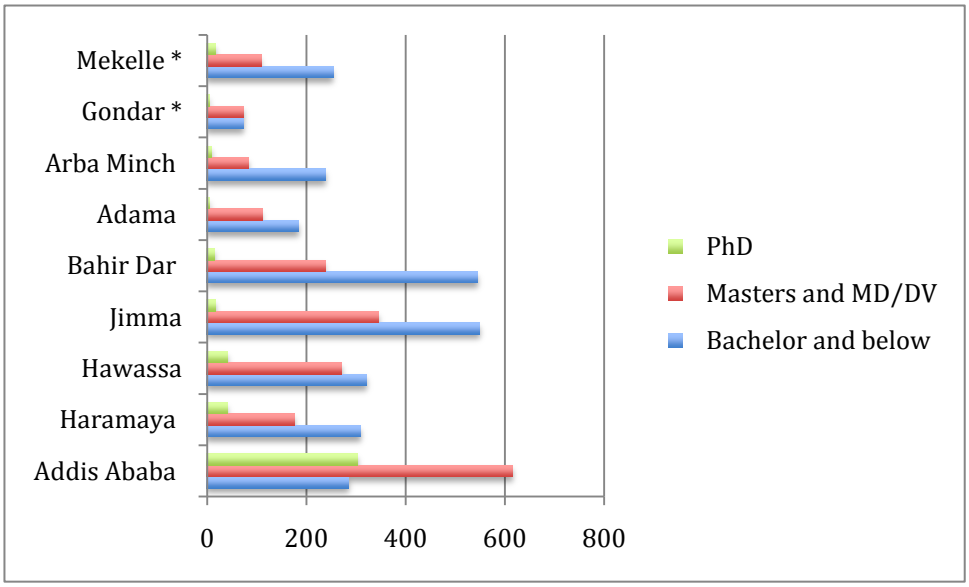
However, the ministry engages quite substantially in the management of institution by appointing the chair and three other member of the university board, which makes up majority in decision-making. Above all, the ministry has a veto in dissolving the Board as deemed necessary. The University Board, which is in so much controlled by the government, is the highest managing body of the university. It performs among other major decision like nominating the university presidents, reviewing and submitting university's proposal to the ministry and overseeing the proper function of University Senate (Ethiopian Higher education proclamation, 2009).

The University Senate on the other hand performs among others functions like approving curriculum; awarding degrees; examining and approval of opening, merger and closure of academic units and advising university presidents.

On the other hand, the Managing Council and the University Council advise the Presidents on matters like administration and academics. The President involve in 'forum for public institution' to consult the ministry on matters the ministry interested (ibid).

5.4 Ethiopian Higher Education Academic Staffs and Students

Majority of Ethiopian higher education staffs are young, with lower level of qualification and are also inexperienced. As can be seen in the figure below, the proportion of PhD holders are by far few. Individual institution can hire only academician holding masters degree and above and as to the rest hiring is made centrally on behalf of all public institutions. It is important to notice that majority of academic position were held by first degree holder, though staffs are quickly upgrading their qualification in recent years.



* Denote 2005/6 data

Figure 2: Staff by education level of selected universities for the year 2006/7
Source: adapted from MOE statistics annual abstract 2007/8 (Ministry Of Education, 2009)

It is worth to notice that apart from the higher composition of less-educated staffs, that academic staffs working conditions are deteriorating. Tessema has discussed the recent higher education staff disempowering processes in light of massification in Ethiopia, which reveals worse working condition. He has described disempowering through; intensification, deprofessionalization and peripheralization.

'Intensification; Over-engagement of staffs as the daily class last for 12 hours, Monday to Friday, for the entire year, because new student come into two or three installment'(Tessema, 2009:p 37). *deprofessionalisation*;where staffs are disentangled from their professional scholarly engagement into few procedural and repetitive activities, Routinisation.

> '*Quite pervasively, teaching (in Ethiopian public university) is often and increasingly considered synonymous with being punctual for classes, taking class regularly, full coverage of curricular contents during the semester, being available in offices, carrying out invigilation assignments, submitting grades in time, allowing students to see their examination papers, and taking attendance'* (ibid, 2009 : P 38).

Peripheralization; majority of the academic community is not taking part in the decision making activity; staffs valuable voice are not heard; most notably staffs are not recognized (ibid).

In addition to this, the Ethiopian academic staffs have also weak relationship with international scholars (Amare, 2010). The weak academic composition, working condition and poor intellectual environment must have contributed for an almost absence of Ethiopian academic scholar from the international arena.

Coming to student enrollment, the decision as to whom to enroll even to the level of faculty is made centrally (Ministry of Education) and it is absolutely based on the national exam and student's interest is also taken in to consideration. Hence an almost fair distribution of talent is made across institution. Then, institutions allocate students with in faculty to a specific study program based on student's interest, national exam result and high school achievement. As to graduate students, institutions enroll their own students, where institution use standard tests specifically designed for programs.

5.5 Ethiopian Higher Education Finance

The public expenditure for education in Ethiopia is rising recently. In 2005, the public expenditure on education was 5.5 percent of GDP or 23.3 % of government spending. Looking into the proportion of higher education alone, it account around 39% of the total educational expenditure (World Bank, 2009).

The two major expenses on the Ethiopian Higher education is administrative and salary expense. For instance for the year 2007/8 the Federal Government budget for administration expense was 58% while salary expense was 30%(MOFED, 2010 b).

The share of higher education has also raised due to the major expansion and opening of new universities. Yet, the annual recurrent expenditure per student is roughly $860 once again is lower compared to so many African nations (Saint, 2004). In other word, more students are thought with less money.

5.6 Poor Research Production

To have clear picture of the production of research in the Sub-Saharan region in general and specifically in Ethiopia, here are some figures. In the year 2007, the share of Africa in population of researcher was only 2.3 percent of the world. Sub-Saharan countries account only 0.6% of world research population (UNESCO, 2009).

The Ethiopian case is even worse, for instance; there were only 2,187 and 2, 377 total researchers in the year 2005 and 2007 respectively (ibid). The other way of quantifying the researchers is in terms of the total population of the nation. Thus there were only 30 researchers per million population of Ethiopia while the world average was 1,063. It is also important to note the expenditure on research against GDP. Ethiopia's expenditure on research and development as percentage of GDP was 0.17% in 2007 while the world average expenditure the same year was 1.7% (ibid).

System-wise, the higher education proclamation requires academic staffs to devote at least 25% of their time in research. Nevertheless, in Ethiopia the poor academic infrastructure, the research population as well as the expenditure in research being extremely low, resulted in an overall few and poor quality production of research.

5.7 Brighter prospects amid challenges

In spite some of the rough phenomena seen earlier, currently, it is possible to point out the change in attitude by international, multilateral, and regional organization with respect to knowledge, research and support to development which in one way or the other contributes to

excellence.

Greater part of the unexplainable growth and development in the emerging countries is due to the human resources as many economists argued (World Bank, 2002). In recognition to this fact, individual nation are changing their outlook on financing as well as providing technical support of developing countries development. Now more often than in the past, donor countries are considering of taking the high road to support finance excellence initiatives of developing countries. Ethiopia being developing country too benefited. To mention couple of instances, The Netherlands supported in the establishment and continuation of The Higher Education Strategic Center (HESC) and The Higher Education Quality and Relevance Agency (HERQA) (NPT, 2010), as part of the 2003 proclamation of the Ethiopian higher education.

Likewise, Germany in an effort to build excellence Model University in Ethiopia, took an initiative of first of its kind in Adama University. This excellence model university has an objective among other; to become excellence in teaching and research, to be center of vocational teachers education, to develop university – enterprise relationship and last but not least has an objective to attract an international partnership of network (Eichele, 2010). Germany's excellence initiative also includes hiring up to five highly capable international experts to preside over Ethiopian Universities, like the one Adam University is already enjoying (German Academic Exchange service -DAAD, 2009).

Among the intergovernmental organization, the World Bank has changed its basic conception of what support to the developing countries should look like by recognizing the importance of knowledge. It is important to bear in mind that the World Bank until recently had had a policy of promoting primary and secondary education at the expense of tertiary education by only considering individual rate of return (Collins and Rhoads, 2008).

Regional initiatives like the African institute of science and technology (AIST) has the intention of strengthening the field of science and technology and management and economics (AIST, 2009). The African institute of Mathematical Science (AIMS) aims to strengthen the computational capacity of African students in research and technology (AIMS, 2009). These programs are part of the New Partnership for African Development (NEPAD). AIST and AIMS programs are so small that it can be compared as a drop in the ocean.

However, the initiatives tell the desire from the region itself in way of investing in research excellence and knowledge producing capacity.

The change in the attitude towards believing a strong human capital leading to development extends to the national as well as institutional level. For instance, in 2008, the Ethiopian government has decided to enroll 70% in natural sciences and 30 % in social sciences in public universities in an effort to reverse the trend (University World News, 2008). (Note that the share of business, accounting, management, and marketing which had had been 25 % of the total enrolments in 1993 had increased to 43 % of the total enrolments by 2004 (Saint, 2004).) It is intended to direct the future direction of the nation into industrialization and technology transfer.

Most importantly, among the internal reform to embrace excellence can be manifested in the implementation of Business Process Reengineering (BPR) across all higher education institutions. As can be seen from the case, Addis Ababa University, there are more intention to embrace change in the way the university run the core process; human resources, community services, student services, teaching and learning, and research. The major motives behind the reform include the need to bring about excellence and the realization of the need to catch up with swiftly changing world.

In general, economically Ethiopia is poor country where majority of its population depend on subsistent farming. However recently, the country is incurring major achievement on economic development. Correspondingly, the higher education sector is progressing at an alarming pace as measured by fund, enrollment and number of institutions.

On the other hand, inside institution; there are few well-qualified staffs, and also infrastructure is poor, staffs face deteriorated intellectual environment, academic freedoms aren't exercised and few researches are produced. The major recent reforms empower more the state to control institution than to rearward autonomy. Against all these counter-excellence phenomena, excellence is being praised by; for instance, World Bank recognition of the importance of knowledge production and higher education in supporting development, similarly, some donors took practical higher education excellence initiatives; most notably some of national government's move to embrace reform and at last regional excellence initiatives can be noted.

Chapter VI: ANALYSIS

In order to unravel the institutional characteristics of excellence research universities, it is better to start the exploration with the national system. This way, the context in which each case study university operates becomes more understandable. In addition to this, the national system help to inform the discussion part by providing a holistic perspective to the creation of REU. Accordingly, the analysis is divided into two main parts, the national and institutional. The first part is dedicated to the system wide case of the UK, USA and note that the Ethiopian Higher Education system has already dealt in the previous part. The second part is all about an analysis of the characteristics of case universities that have been identified in the methodology part.

6.1 National systems case

6.1.1 The United Kingdom case

This sub part shades light on the UK's higher education system overall governance, finance, market and student characteristics.

The UK higher education system has a structure of 3-year undergraduate. All level above undergraduate is called postgraduate and depending on the type of study, it may take one and two year for professional and research degree respectively, while some undergraduate professional to last 5 years (British Council, 2010).

In the UK system, institutions like Cambridge and Oxford have long history of existence and are known for the production of political elite of the nation and as such others are disappointed in that they fail to produce industrial leader (Clark, 1983).

Clark describes the UK system as "Strong authority at the bottom and modest degree of administrative power in the middle"(Clark, 1983). Meaning that more power of governance is held at faculty level.

Based on the data from UK's Higher Education Statistics Agency, in the year 2007/8, there were around 2.3 million higher education students in the UK. The student's mix is as follows10.7% postgraduate, 53.4% undergraduate, 10.9% postgraduate part-time and 24.8% undergraduate part time. Thus around 80% of the students are following undergraduate level programs. At the same time 15% of the student body are foreigners. It is also important to

note that the proportion of foreign student is greater at postgraduate level than undergraduate (HESA, 2010 a).

Funds can be collected from sources such as; 37.7 % funding body grant, 25.4%tution fee, 15.9%research grant and contract, 1.9% endowment income and 19.1%other income. Once again this fund is used up for expenses and can be categorized into 57%staff cost 35.8%other operating costs, 5%deperciation and 1.3% interest expense (HESA, 2010 b).

The Higher Education Funding Council of England HEFCE and other UK Higher Education funding bodies namely the Scottish Further and Higher Education Funding Council (SFC), the Higher Education Funding Council for Wales (HEFCW) and the Department for Employment and Learning, Northern Ireland (DEL), makes the fund for research. The fund bases on the Research Assessment Exercise (RAE). RAE is based on expert review undertaken by specialist panels comprising of academics and research users. The assessment uses Unit Of Assessment (UOA), which can be program or discipline of research engagement and based on the 2008 RAE, there were 67 such units (RAE, 2008 a).

Institutions are free to determine how many and what to submit for the RAE. Routine test and work on educational material are excluded from the assessment, instead, research of original finding and impact in the existing stock of knowledge are assessed.

So far RAE has been conducted every four or five years and the recent assessment (2008) have come to the conclusion that most of UK's researches are high quality by international standard (RAE, 2008 a). However, this does not keep the UK from worrying about losing of its edge of excellence to the US. The concern has specially come after a survey where it found 26% of Royal Society Fellow worked outside UK (12% being in the US). At the same time 60% of institution reported difficulties in recruiting lecturers on certain subject notably IT, Business, science, engineering and Medicine related subjects (Secretary of state for Education and skills, 2003).

6.1.2 The United State of America case

The US department of education involve in limited way in higher education institutions governance. The involvement can be among other thing in overseeing use of federal grant for

teaching and research, implementation of civil right act legislation with regards to higher education, and at time taking part in the development of special program and curriculum. Unlike many other countries, USA does not have ministry of Education that organize higher education. In line with this fact, the US higher education system is often depicted as "diverse, decentralize and inclusive" (American council on Education, 2001).

Further, the system is also expressed as "large, competitive and entrepreneurial" (Gumport, 1993). In the system, buffer organization like the national research council, which does not receive direct fund from federal government, oversees the research effort of the nation and help in public policy making. The system has also introduced the two-tier system Graduate school to the world during the late 19th century (ibid). Clark also characterized the American system of higher education in comparison to the British, as having weaker faculty influence and powerful trustee and administrator (Clark, 1983).

In the US system, institutions are organized hierarchically and from bottom to the top of the hierarchy; community colleges with 2 years of program (offering an associate degree), 4 year college professional or general undergraduate, and comprehensive university hosting both undergraduate and graduate education. The undergraduate study usually includes the first one or two years of liberal/general education and the remaining year of specialization.

The system is very permeable in that transfer between institutions and continuation of career development with increase credential is common. In the year 2007, system wide the composition of faculty staff account around 38.8% and faculty assistance 9.1%; while, administrative staff is only 6.1% (Digest of Educational statistics, 2010 c).

For the year 2006/7, the major source of fund for all four year public universities was; 24.26%public appropriation, 17.64% public grant and contract, 16.77% students tuition fee, 6.59% investment income and the remaining balance being from sales of services and other sources (Digest of Educational statistics, 2010d). The same year expenditure of all public institution can be directly traced as 28.13% instructional, 10% research, 15.2% for academic and institutional support, and the remaining for operation interest expense (Digest of Educational statistics, 2010 b).

Enrollment for the fall 2006 was 18,205,474 of which 76% was enrolled in public institutions. It is also important to bear in mind that nation wide student /staff ratio is 5.2(Digest of Educational statistics, 2010a). Institutions recruit their own students using standard tastes and other non standard qualification.

Student use both institutional (accredited institution) and specialized accreditation (accredited programs) data in choosing institution to apply for. At the same time Federal Government use such data in identifying to which institution to grant fund. These accreditation agencies are buffer organization, which are found in the middle of institutions, federal government, employers, students and so on.

Research excellence initiatives are taken at state level, for instance the California Institute of science and innovation injected some funds for university industry partnership since 2000 (Salmi, 2009).

Overall, the US system of higher education system is endowed by abundant information. It has supported the market system to prevail to greater extent.

6.2 Institutional case

So far, the two countries, UK and US, higher education systems bold characteristics have been described in the first part. Besides, the research context chapter provides a description about Ethiopian higher education system. In this second part of the analysis, each case study universities shall be described against their basic characteristics of practice teaching, research and industrial relation. In addition to this, the description shall include how the case institutions organization structured, financed as well as staffs and students are recruited.

6.2.1 University of Cambridge case

Teaching and learning

Cambridge is established 800 years ago and is one of the oldest universities in the world. At the present, there is no single campus under the name of Cambridge; rather, it is collection of 31 campuses that makes Cambridge. For the year 2007/8 Cambridge have student body of 11,826 undergraduate and 5,836 postgraduate (Cambridge, 2010a).

Like any other universities, at Cambridge learning takes place across many ways of teaching and learning; lectures, seminars, practical work, field work, study visit, independent study and supervision. Cambridge University calls its tutorial *supervision.* It is a more distant and regulatory in its format as compared to the Oxford's counterpart *tutorial*. Cambridge claims that it has reinforced students' independent study to greater extent. 'There is much greater emphasis on independent and self-directed study here (Cambridge) compared with what one has been used to as school or other college'.

Cambridge has dedicated to advancement of teaching and learning with in its university through a project like learning landscape project (Cambridge, 2010 b). It is a project initiated with the aim of identifying through research the various possible ways of offering best environment for students. The project also helps Cambridge to constantly experiment new ways of improving teaching and learning. It tries to integrate stakeholder's viewpoint on constantly changing environment.

'At the heart of the Cambridge curriculum is the *Tripos*, where all Cambridge undergraduate courses are assessed through examination in broad subject area called *Tripos*. Thus, students may be required to take two or three *Tripos* as the case may be. Each *Tripos* may be taken after one year or two (Cambridge, 2010d). It allow student to wonder around various courses through the first year in identifying which area to specialize and help first year students to switch majors in the year ahead as well. At the same time, *Tripos* clearly separates the first part from the specialization in evaluation and report. Therefore, *Tripos* is Cambridge attempt of creating liberal and specialized education as well as a separate evaluation of its own kind.

Cambridge offers around 91 undergraduate courses; meanwhile, at postgraduate level, there are around 126 research and 107 thought programs as can be seen from official website. For research degree final grade is awarded for thesis or dissertation rather than for parts of courses taken. Cambridge's close to half student body is enrolled in either Art, or Humanities, or Social Sciences. Natural science and physical science take the remaining half.

Cam CORS is the teaching technology in use at Cambridge. It is an online reporting system for supervision and eases the communication between supervisor and students.
CamTOOLS, is another technology that provides an online learning module at Cambridge (Cambridge, 2010d).

In general, teaching and learning at university of Cambridge is characterized by an innovative methods like, *supervisory* method of tutorial, *tripos* method of course organization and reporting, use of teaching technology like *CamCORS* and *CamTOOLS* and above all dedicated to excel in teaching and learning.

Research

At Cambridge, research is organized in department, faculty, schools and institutes. The 126 research programs at postgraduate level show the vastness of the research activity at Cambridge.

A separate unit called Undergraduate Research Opportunity Program (UROP) organizes undergraduate students research experience. Under this umbrella students will have first hand experience of some of world-class research undertaken in the university of Cambridge. The placement in this program help student to get acquainted to research and also earn around £220 per week for the10 weeks.

THE UK's RAE 2008 result showed that 31.7 percent of Cambridge's submission were in 4* category (world leading) while 39.2%were in the 3*(internationally excellent)(Cambridge, 2010d). Since the major funding is based on RAE, the University of Cambridge has a RAE coordinating body that help the assessment team as well as help answer question arising from schools related to assessment. This is intended to help in preparing the university response to the assessment so that large amount of fund could be attracted. Staffs are covered for liability and indemnity arising from professional consultation by Cambridge enterprise. This is mainly to encourage academician in taking risky consultancy services. Further, academicians are assisted in publishing their research undertaken at Cambridge through publishing offices (Cambridge Enterprise, 2009). Lastly, Cambridge has put so much effort by devising a methodology for accurately capturing full cost of research activity, in way of achieving efficiency (Cambridge, 2010 e).

To sum up research activity, University of Cambridge has provided a golden opportunity for undergraduate student to engage in research activity. At the same time, the research

environment at Cambridge is favorable as consultation on RAE and liability coverage on professional risk is in place.

Finance

The government, through the Higher Education Funding Council (HEFCE) and training and development agency (TDA) provides a block grant for teaching (a grant determined by the quality and volume of research through the RAE). In addition to this, students fees charged for instruction and facilities; Research income from publicly funded Research Councils, charitable, foundations, and through collaborations with the private sector; benefactions and donations for current use, investment income from accumulated endowment; income from services provided to external customers, including the customers of Cambridge Assessment and Cambridge University Press, and lastly a small but increasing income from commercialization of intellectual property.

The major source of incomes for the year 2007/8 are : 36% from Research grant and contract, 29% from HEFCE and TDA, 11.4% tuition fee income, 6.2% endowment and investment income, and the remaining 16. 5 % was miscellaneous income (Cambridge, 2010a).

Around 66% of Cambridge's income comes from direct government block grant or research grant and contract. No single source hold more than 36% of the major income. It is important to note that Cambridge operates at a net asset of £1.8 billion. The major expenses include; research, academic department and, administrative expenses taking 30.8%, 30.5 % and 10.2% respectively (Cambridge, 2010a).

Research and academic department expenditure are relatively proportional and accounts around 60 percent of the expenditure. At the same time, administrative expenses account only 10%.

Diversified source of funding can be seen from the list and yet more reliance on public purse is apparent at Cambridge. It is also important to notice that expenditure pattern is characterized by less administrative expenses.

Organizational structure and leadership

'University of Cambridge is a confederation of colleges and faculties and other institutions'. Each college is an independent entity with its own income and property.

The House of Regent is at the top institutional governing body. It has an electoral constituency of 3,800 members. It makes and amends rules, elect member of the Council (executive body of the university), elect Board of scrutiny. Most importantly, the House of Regent elects the Vice-Chancellor up on nomination by the Council. The Vice-Chancellor is powerful person in the university and run much of the university's activity. Nevertheless, the top of the apex is, the Chancellor, who has figurative/ ceremonial role, is elected by senate for lifetime as constitutional head of the university.

The Council is the principal executive and policymaking body of the university. It administers the university by defining mission, planning and management of resource allocation. The Council consists of college heads, professors, other member of regents and students. Most importantly, it includes two external members, who are appointed by the House of Regents, with whom one will chair the audit committee.

General Board is an advising body to the Council and the House of Regents on matter of education policy and resource. It consists of 15 members; students Vice Chancellor and member of House of Regent appointed by school or procedural qualification. Pro-vice Chancellor executes quite a vast array of tasks; planning and resource, education, research, personnel and other special responsibility. Cambridge also follows the collegial system of governance (Cambridge, 2010f).

Much of the university day-to-day activity and execution falls in the hands of the Vice-Chancellor whom could seek advice from the various standing and temporary committees of the Council.

Relation with industry

University of Cambridge has reputation for the quality, breadth and depth of its industrial link world widely. Companies can be established on land or building leased from the university, they employ their own staff to carry out research and have research relation with university. Such arrangement is termed as *proximate company.*

There are also similar arrangement where university research is carried in collaboration with business or creation of new companies, also known as *embedded companies*; these are A) Co-located companies, which are the typical *embedded companies*. B) Spin-off companies, which are usually owned by Cambridge University, with no full time staff and funded by the Cambridge university challenge fund. C) Small tenant companies; pays for rent or the use of unique material and facility of the university. D) Other companies also known as silent or invisible companies (due to their low profile); they are run by student and/ or staffs and use the university resources (Cambridge, 2010g).

Cambridge has three overlapping business units through which commercialization is performed.

1. The technology transfer; engaged in activity of disclosure of patent
2. The consultancy services; help advising on contracts, negotiation and pricing of universities commercial activity
3. Seed fund venture; help in providing fund in form of discovery fund, challenge fund and venture fund.

The Cambridge enterprise limited is wholly owned subsidiary of the university of Cambridge and manages challenge fund, trading company and university venture fund.

It is worth mentioning that Cambridge and Massachusetts Institute of Technology (MIT) set partnership called CMI in area of innovation and exchange. The idea is through the means of linking education, research and industry and take big technology and science initiatives (Cambridge, 2010h).

The university of Cambridge is sponsored by renowned organizations like GSK, Rolls Royce, Pfizer, AT&T Laboratories, and Qinetiq.

In total, Cambridge set aside money to successfully turning research output into commercial product or company. Provide space for business and university's researcher to work together on project of common goal and also has close collaboration with universities that are found even across the Atlantic Ocean.

Faculty recruitment

With respect to faculty recruitment, Cambridge like the rest of the other case university of this study hides its practice and it is almost impossible to collect specificity of the process. However one thing is clear that each college hires the brightest academic staffs. Due to an old tradition of being prestigious university highly successful professor across the world in general and particularly from the UK opt for employment in Cambridge. Cambridge fills the position of research assistant through its excellent doctorial students and develops to the position of research associate and senior research associate.

As to the composition of staffs, at July 2008, there were; 31.5% contract researcher, 18.6 academic related, 17% administrative and clerical and 14.5 % academic related staffs. It is clear that the staff composition showing much more reliance of contract researcher for majority of research output (Cambridge 2010i).

Student admission

In the mission statement of Cambridge one can find statement like "Selecting the best and the brightest regardless of who the students are". Statement of such kind tries to appeal to all able students. All colleges' of Cambridge select their own students by setting students' past course achievement. At undergraduate level, these requirements are subdivided as courses which are; *essentials, highly desirable, desirable* and *useful* in their appropriate level of importance for acceptance decision. In addition, student may be required to write short essay and/or sit for interview.

Although students can apply for colleges of their preferences with in Cambridge, an applicant's chance of admission does not depend on the choice of colleges. Colleges' success rate is very similar through leveling mechanism called 'pool system'. Nevertheless, prestige differs across colleges in the eyes of the public in spite of the claim by Cambridge that all colleges are equal. This level of prestige can be measured in terms of number of applicants to the availability of places to a particular college. In general around one in four undergraduate applicant offered a place in Cambridge.

On the other hand, most graduate program use blend of interview and additional tests like Thinking Skill Assessment (TSA) test. This test is designed to assess critical thinking and problem-solving skills, which are highly relevant. The TSA isn't subject-specific, so can be

applied to various courses. In addition to TSA, Biomedical test and Cambridge law test also serve the purpose of selecting appropriate candidate for their specific program (Cambridge, 2010c). At Cambridge, 65 percentage of the student body are enrolled at undergraduate level. Among the postgraduate students the composition of research program is more than three fold that of thought programs (Cambridge, 2010a).

By and large, Students are admitted based on their specific course performance evaluated against the set of major they would like to pursue. Each college processes its own student applicants' credential only to share it at university level for leveling purpose. For postgraduate students often required taking Cambridge specific exams to qualify for admission. Lastly, it is interesting to find the fact that college's prestige varies even with in the same institution.

6.2.2 University of Oxford case

Teaching and learning

There is no full document as to the exact date when Oxford was established; however, first lecture conducted at oxford was as far back as 1096. Oxford has 38 colleges and 6 private halls that are all an integral part of the university. The University of Oxford commit to excellence with reflection of six overarching long-term objectives. These are: performing outstanding research, providing exceptional high level education, attracting student of high potential, attracting high calibre staffs, delivering outstanding facility for students and staffs and contributing what is produced to society. Among the most frequently referred values at oxford includes, academic freedom, collegiality and the pursuit of excellence (Oxford, 2010 L).

Oxford is known for the *tutorial* system of teaching. It basically gives a high level of individual attention to students. The *tutorial* system helps students independent learning by letting students wonder around specific topics of relevance. Good library book collection is a base for Oxford's *tutorial* system, as the t*utorial* methods of teaching and learning make students search for books on specific topic and come up with certain writing.

It is important to notice oxford's *tutorials* are often less formal (Palfreyman D., 2002). It also involves question and answer session where students actively take part in the learning process. Now days, due to an increase in student intake, the tutorials are rather becoming an

experience of two, three or four students accompanied by the tutor, unlike the old day of one to one tutorial.

Apart from *tutorial*, Oxford also makes use of lecture, fieldwork and seminar in teaching and learning like any other institutions. Unlike *tutorial* system, lecture has purpose of transfering information and interaction is limited by large number of individuals (ibid.). In addition to this, WebLearn virtual learning environment (VLE) has been developed at oxford to include tools to support traditional teaching models. It facilitates communication between students and staffs through sharing of resources and online discussion.

At Oxford academic divisions are broadly categorized as Humanities, Mathematical, Physical and Life Science, Medical Science, and Social Sciences each runs 12,10, 24 and 22 programs respectively at postgraduate level. Oxford also offers around 49 courses at undergraduate level. And at the same time, 17 part time programs are run at master level (Oxford, 2010 a).

Oxford's commitment to teaching and learning can uniquely be seen in its use of the *tutorial* system with contemporary teaching technology in the middle of mass higher education. Besides, student independent learning is the center of its curriculum. Lastly, it is important to note that, at Oxford, slightly less courses are offered compared to other case research universities.

Research

Scale of research activity at oxford ranges from the fact that it is undertaken by the existence of around 68 departments at postgraduate level, to the fact that it is done by more than 1,600 academic staffs, More than 3,500 contract researchers and last but not least by more than 4,637 graduate research students. No specific data is available as to the nature of oxford's research engagement. Nonetheless, Oxford's strategic plan for the year 2008/9-13 express deep commitment on Science, Medicine, Social Science and Humanities (Oxford, 2010b). As it can be see in the next part, medicine and physical science take the big share of Oxford's research engagement.

In the year 2008, RAE rated Oxford's research with 32% as 4*(world leading) and 70% as 4* or 3* (world leading or internationally excellent) (Oxford, 2010c). By and large, Oxford

claims that it has submitted the largest world leading and internationally excellent research to the UK's RAE. It had submitted more research staffs than for instance Cambridge did, and an adjusted rate brings Oxford on top of Cambridge. Nevertheless, as it has been seen earlier, Cambridge has got the highest rate around 80% rated 3*or 4*.

Finance

For the year 2008/9 around 40%of the incomes of Oxford came from research grant and contract. In addition around 23% HEFCE/TDA and 14% was academic fees. Oxford, 2010 e)

For the year 2007/8 Oxford's research finance can be broken down into two sources; The Higher Education Funding Council of England (HEFCE) and the external sources. The HEFCE contribute to 26 percent of the funding. From the external fund the 2/3 is from both UK charity and the UK research council each accounting approximately equal with the remaining balance from sources like industry, other UK public department and oversea sources. Breaking down the expense into academic discipline, 62% went to medicine, while the second largest allocation was to Mathematics, Physical and Life Science taking around 25% of the fund (Oxford, 2010d).

Majority of the expenses are on academic department and researches with 33.6% for research and 27.8% for academic department for the year 2009. Administrative expenditure is a minimum, only 5.5%(Oxford, 2010 e).

Overall, large proportion of the fund comes from research grant. The funds are diversified to at least in form of four major components.

Organizational structure and leadership

Oxford's colleges are founded by charter and endowment from philanthropist (Oxford, 2010f). Each college has its own statues, endowment and governing body. Which in turn give colleges the leverage to manage themselves with substantive autonomy. Further more, strong academic self-governance is one of Oxford's traditions. At the apex of the governance structure is the Congregation, which is 'sovereign governing body' of the university, act like a parliament of the university with around 4,000 members. It consists of academic staffs, heads,

society, senior researcher, administrative staff and so on. Usually the Vice Chancellor chairs the Congregation except in occasions such as confirming degree where the Chancellor chair.

Again at institutional level below the Congregation, there is an executive part of the governing structure called the Council. It consists of several committees (among the major one includes; Education, General purpose, Personnel, planning and resources, and Research committee), four academics and conference of college. The Council is responsible for academic policy and university's strategic direction. Financial matters and academic freedom is the most frequently referred activity of the Council. The Council has also reserved four seats of its 25 to 28 seats for external members up on its nomination and approval by the Congregation (oxford, 2010f).

At oxford, the Congregation is the legislative body of the university while the Council is an executive body. The Vice Chancellor has an ultimate power of chairing the Congregation and the Council. Similar to University of Cambridge, university of Oxford also has a Chancellor that act as figurative representation of university.

Relation with industry

Oxford claim it has vibrant relation with business world through its various offices such as; Innovation Partnership, Education and Training, Graduate Recruitment, and Regional Liaison offices. To strengthen this relation further, Oxford has launched an initiative called Research Information Infrastructure (RII), which is an attempt to reach to all stakeholders in all forms for possible communication of the university's output (Oxford, 2010g).

ISIS innovation is Oxfords' whole owned technology transfer company and worth £ 2billion. By filing one patent per week makes it one of the most successful technology transfer company in the world. In addition, Begbroke Science Park provide service of knowledge transfer partnership between university research and businesses through its; incubator unit for spin off companies, offering of an environment for high tech start up companies and universities entrepreneur to work together, and also hosting interdisciplinary university research and institute of advanced technology (Oxford, 2010h).

Both the Begbroke Science Park and ISIS technology transfer company provide a favorable environment for Oxford and business to benefit mutually.

Faculty Recruitment

Oxford's personnel strategy states an objective 'to attract, develop, reward and retain academic staffs of the highest international caliber' The human resource objective strategy of Oxford falls under five broad themes namely; recruiting high caliber staff, managing and developing staffs, rewarding and retaining high caliber staffs, the new reward framework, and monitoring and evaluating the strategy (2010i).

Making Oxford 'employer of choice', commitment to equality and diversity, and discretionary payment scheme all support in recruiting high caliber staffs. Through the 'research career initiatives', work-life balance, rewarding teaching excellence, and promotion of equality and diversity, Oxford manage developing and retaining high caliber staffs. Furthermore, Oxford implemented a new flexible reward system, which is consistent with the overall structure. Lastly, the Human resource information system, which is implemented recently, integrates alongside with other activity of the university and strengthens the human resource strategic evaluation (Oxford, 2010i).

At Oxford, there were 9,480, staffs at July 31 2008, of which 29.4%research staffs and 21.2% administrative, professional and clerical and only 17.4% academic teaching staffs (Oxford, 2010j).

Students admission

High level of SAT (Scholastic Assessment Test) score (700 or more) is required to get admission at undergraduate level. Like Cambridge each program may require specific course being taken previously and has been divided into categories of *essentia*l, *recommended* and *helpful* based on their level of importance respectively. For graduate level admission, the university assesses students based on their essay (Oxford, 2010k).

Across all four faculties (Humanities, Mathemathical, Physical and Life Science, Medicine and Social Sciences) the student body is fairly distributed except for the faculty of medicine

that host slightly fewer students. It is also important to note that more than one third of the student body is graduate students (Oxford, 2008).

6.2.3 University of California, Berkeley case

Teaching and learning

Being found in 1968, Berkeley is relatively the most recently established university to every gain huge prestige. Among unique characteristics of Berkeley include the range of programs offered, nearly 300 programs. Berkley is pressured by an increasing enrollment at undergraduate level. Undergraduate student per faculty ratio of 15.1 to 1 (Berkley, 2010b) is quite substantial compared to most private RU of similar prestige.

Graduate study courses are conducted by various ways: lectures, seminars, students independent study and reading and as research project under the supervision of faculty. Teaching and learning takes place in big lecture room unlike the Oxford system of *tutorial* or Cambridge system of *supervision*. Interestingly, students have significant level of independence in choosing their course at the discretion of their graduate advisor as long as the minimum requirement for academic residence is meet. In addition to this, Berkeley use teaching technology tool like *'bSpac*e' to complement teaching and learning (Berkley, 2010c).

Large array of programs with no distinctive ways of teaching and learning can characterize University of California Berkeley's teaching and learning. Like many other universities, classroom education is complemented by the use Teaching Technology. There is no so much innovation or peculiar teaching and learning mechanism.

Research

Research is organized at Berkeley by; academic departments, institute and centers, museums and field station. To have a glimpse of the extent of research, there are 80 research units, 8 museums, 130 academic departments and 7 field stations that serve as research venue. The research community at Berkeley includes some 1,500 full time faculty, 9000 graduate students and 1,200 postdoctoral fellows. Research center and institutes also known as Organized Research Units (ORUs) are solely engaged in research activity unlike the academic department, which apart from research perform the duty of offering courses. ORU work on

broad topics of multidisciplinary in unraveling practical real life problem like environment, energy and so on.

Undergraduate research Apprentice program (URAP) is one of the innovative initiatives at Berkeley, which is designed to involve students into the research arena even at the undergraduate level (Berkes, 2008). URAP is a program where undergraduate students are selected through competition to participate at faculty research and earn academic credit per term. Berkeley has integrated research into the undergraduate curriculum. Undergraduate students can also initiate doing research on topics of their interest and get credit, support for advice or get paid. Around half of undergraduate students at Berkeley participate in some kinds of research.

At Berkeley, there are extensive research programs at discipline level as well as interdisciplinary organized in ORU. Berkley also makes undergraduate students to get acquainted with research. Large production of research is expected with more than 10,000 faculty staff, and postgraduate students.

Finance

Berkeley claims that it provides financial support (including loan and grant) for around 65% of its students. It is an attempt to provide access to students who would have been unable to attend for financial reason. For the year 2009 both core operating and non-operating revenue stands at $1.8 billion. From this fund, 34%grant and research contracts, 23%state educational appropriation, 20% student tuition and fee, educational activities and auxiliary enterprises revenue, 8%private revenue and the remaining 3%from other sources (Berkeley, 2010 e).

Around 54% (some 1 billion dollar) is spent in either instruction or research direct expense. The highest amount of spending based on discipline is Engineering, Biological Science, Physical Science, Chemistry and Social Science respectively.

At Berkeley, financial diversity is maintained from at least three major sources; state federal and student tuition. In one way or the other public fund is prominent in that even students tuition fee is at time a student financial loan from public. Instructional and research expense closely resembles the rest case study universities for it take greater portion.

Organizational structure and leadership

In discussing about Berkeley, it is important to stress the very fact that it is public university and also equally important to know that it is just part of the University of California and often referred as Berkley campus of university of California. There are 10 similar campuses under the name of university of California. 'Constitutionally designated *public trust'* and 'involvement of faculty in guiding and management of the university' is among the characteristics that can be sited as peculiarity of the university of California.

Board of Regent is at the top of the organizational structure of California University as a whole, consists of 26 members (where18 is appointed by governor, one is student and seven are Ex officio members).There is strong message where an attempt is made to immune the appointment of the board of regent from political influence (Berkeley, 2010 M). Under the Board of Regent rests the president, which will be followed by chancellors of the 10 campuses. The university as a whole is run by an academic senate and again each campus has its own academic senate (Berkley, 2010K).

The system wide senate advises the president on matters ranging from promotion, demotion of professors to educational policy and budgetary issue. Likewise, each campuses senate advises the campuses top official on how to conduct their affairs. *'Shared governance'* is the term that is usually mentioned in the management of University of California (Berkley, 2010j).

Unlike many other universities, Board of Regents governs Berkley at distant as there are 9 more similar campuses under the University of California to be run. Nevertheless Berkeley campus like the rest of the others shared its governance with its own senate at campus level and university wide (Berkley, 2010d).

Relation with industry

The university of California run the office technology transfer, which is now to operate at campus level. Therefore, Berkeley campuses own technology transfer offices. The office has purpose of serving community and generating income (Berkley, 2010f).

Berkeley alumni have founded or lead hundreds of California companies, including Intel, Chiron, Google, Gap, PowerBar, and sun Microsystems. Many of Berkley's alumni are leaders in academia, the arts, industry and business, technology, and government (Berkley, 2010g). Berkeley is located very close to an area often referred to as Silicon Valley also known as high tech innovative area. Though much of the credit for the valley is attributed to the Stanford University, it has an implicit effect to the university of Berkeley's operation.

Faculty recruitment

The department head in collaboration with the human resource employ service unit identify vacant posts and inform the departmental employ for possible promotion or transfer for internal recruitment. For an external recruitment Berkeley worked on maximize the diverse pool of qualified applicants so that most qualified individuals are hired while attaining the objective of affirmative action (Berkley, 2010h).

The university of California academic personnel manual states that 'superior intellectual attainment, as evidence both in teaching and research or other creative achievement is an indispensable qualification for appointment and promotion'. Excellent demonstration on both teaching and research is pivotal for possible promotion (Berkley, 2005). Berkeley is particularly concerned about losing its excellent staffs to other universities.

There are 2,131 both full time and part time instructional staffs at Berkeley of which 51 are international. Substantially smaller population of staffs compared to the 35,000-student body they serve (Berkeley, 2010 L).

Student admission

For Undergraduate, use of General Education Development test result of high school diploma. Rigor record of secondary school academic GPA as well as applicants essay are very vital for admission decision. Standard test score like SAT and ACT (American College Test) are second most important and there is no minimum or 'cut off' points for standardized test at Berkeley. Class rank and recommendation are not considered for admission decision. Berkeley also use Advance placement (AP) for 'high stake' students for admission. It is an arrangement where high school student take honor courses or college level course and get credit for it (Geiser and Santelices 2004).

Among the non-academic criteria considered for admission includes candidates residence being from California. Secondary to this, candidates extracurricular activities, personal quality, work experience and volunteer work are some of important criteria for admission decision. Alumni relation is considered but not important for admission decision. In addition to the regular undergraduate in take, transfer from another institutions is possible up on the evaluation of personal statement and academic achievement.

According to the 2008 data of the 35, 409 students, 70% are enrolled at undergraduate level while 26% are at graduate and only 3 % at first professional degree. Undergraduate student body is segmented into discipline; 20% social sciences, 13%Biological science, 12.6 %engineering, 5.5% English, 4.9 % business and 4.8 % interdisciplinary (Berkley, 2010i).

To see the level of selectivity at Berkeley; 91%of freshman students have an average GPA 3.75 and higher. Further, 98%of first year freshman students had high school graduate class rank of top ten. Nevertheless, the undergraduate admission rate was around 22% for the year 2009 (Berkley, 2010b).

6.2.4 Harvard University case

Teaching and learning

Harvard was established in 1063, even long before the existence of the nation USA, as we know it now. It is modeled after English college Oxford and Cambridge especially during the first 230 years of its existence. Yet changed quite dramatically with the opening of the three professional schools of divinity, Medicine and Law and latter graduate department was created in 1872. It was only in 1929 that the number of students had reached 1000(Harvard, 2010a).

By then restriction on the growth of student population was sought. There are 37 different programs run at undergraduate level by Humanities, Natural Science and Social Science faculty. The largest program-hosting faculty is the humanities with natural science and social science taking the share of the remaining programs proportionally equal.

Harvard has a center called C.Roland Christensen, which provide services in four broad areas namely; coaching faculty, communicating best practices, convening colloquia and workshops and conducting research about teaching and learning for the contributing for constant advancement of oxford. Coaching faculty may involve giving orientation to videotaping and giving feedback to faculties. In addition to this, best practices and tips about teaching and research are communicated across departments (Harvard, 2010c). Most importantly, the center is devoted in performing action research in several issues of teaching and learning at Harvard.

Harvard is also known for most innovative ways of teaching, for instance in Harvard Business College is known for introducing '*Case Study'* methods of teaching and learning. Student to faculty ratio at undergraduate for the year 2008 was 6.8 to 1 (Harvard, 2010b). Which obviously resulted in closer attention students from the side of the faculty.

Synergy between research and teaching is often mentioned in the document stating that faculty often find their own 'research and teaching supporting one another' Harvard claims that 'All faculty members, including among others Nobel Prize winners, communicate with all levels of students undergraduate to doctorial.' However, there are worries where teaching is not given due attention as research in spite of the fact that increasingly teaching is valued in tenure decision.

Large influence of Oxbridge is manifested at Harvard. An obvious fact could be the learning center devotion to research at Harvard's teaching. High individual student attention is also characterized as a result of the staff student ratio.

Research

There are 166 different research and academic center of which 55 are interdisciplinary or multidisciplinary by nature. For the year 2008 of the 20,307 students enrolled, only 7, 156 were undergraduate, the remaining 10,401 and 2,763 were graduate students and first professional degree students respectively (Harvard, 2010d). More than half of the enrollment is at graduates level.

Harvard explicitly mention that it follow rigors academic standard in selecting academic community. Those that meet the standards only that are awarded to be principal investigator and can seek external research support. The university promote principal investigator to pick theme of interest for research. Harvard has strong argument in favor of prompt publishing research findings and collaboration with individual or groups. The university has a strong message of putting the goal and commitment of university above all other sponsor when it comes to contract research(Harvard, 2010g).

At Harvard, excellence of research production is maintained through the selection process of determining principal investigator. Principal investigators can have a supportive research environment and finance. This drive faculty towards excellence research production. Most importantly, large concentration of staffs and graduate students create size of research out put.

Finance

Harvard is the largest endowed university in the world. Endowment fund of $26 billion in the year 2009 is by far the largest in comparison to many other universities across the world. The major fund for Harvard for the year 2008 was: endowment income, student fee, and government grant and contract sharing 34%, 20% and 15% of the fund respectively (Harvard, 2010d).

Harvard University can be seen as having diversified source of fund and interestingly has little dependency from Federal government fund, 15%. Nevertheless there is a tendency of relying too much on the endowment income. Perhaps this is due to the extraordinarily large amount of endowment fund. On the other hand, for the year 2008, around 44% expense (28% instructional and 16% research) can be traced directly to either instructional or research activity (Harvard, 2010d) .

At Harvard, like all the other case universities financial diversity is maintained but in a different way in that much reliance on its own endowment investment income and may be affected by the stock market in the long run.

Organizational structure and leadership

At the top of the governance structure of Harvard university, there are two governing body; the Board of Oversee and Harvard Corporation. Board of Oversee is made of 30 members, who are diverse in their area of expertise; influence the strategic direction of the university. Unlike the rest case study universities, Harvard's Board of Oversee has few members. Five Overseers are selected each year over a term of six years. The Board of Overseers plays very crucial role in Harvard's maintenance of highest standard in the world.

The other governing body is the Harvard Corporation, which is also known as the President and fellows of Harvard College, consists of the president, treasurer and five other fellows, Often the corporation is regarded as operate in and informal and consultative manner' at the top of system in which much of the power is really delegated to the dean and faculties.

Harvard's decentralization and delegation of power and financial arrangement to the principal academic units has been often described as "every tub on its own bottom". Harvard has nine faculties and one institution which all are run by their respective deans and heads where the president appoints the deans and heads (Harvard, 2010e).

Relation with industry

Harvard reaches out to industry through Office of Technology Development (OTD). It tries to link Harvard's innovation to commercialization. The office involve among other thing in; 'bridging the gap between libratory and industry, evaluating in patent of universities discoveries, stimulating innovative technology development, licensing and building sponsor research collaboration.' In sense the office function as facilitator of universities research activity and industrial engagement. OTD is a coordinating unit of Harvard research enterprise to commercialization by adding value to the system (Harvard, 2010f).

It is important to notice that the existence of another highly prestige university, Massachusetts institute of technology (MIT) in close vicinity fostered the flourishing of many companies in the localities.

Faculty recruitment

Not so much information is available on the mechanism of how staffs are recruited at Harvard. As to the head count made at July 1, 2008, there are 2,048.6 full time equivalent instructional faculty staffs at Harvard. Non-faculty staffs at schools and institutes account for 70.3 percent while administrative staffs are 24.5% of the non-faculty staffs (Harvard, 2010d). Harvard's faculty can be characterized as more populated with non-faculty staffs.

Student admission

General college preparatory program is recommended for getting acceptance but not high school diploma per se. The admission decision is rigorous and involves all sorts of academic (includes secondary school record, academic GPA(Grade point Average), SAT and ACT, application essay) and non-academic measurement (interview, extracurricular activity, personal quality, volunteer work etc), but do not consider students' residence, level of interest and high school rank (Harvard, 2010b).

On the year 2009, out of the 29,114 students who have applied, Harvard has admitted only 2,175. It clearly shows the extent of Harvard's selectivity. The student composition for the year 2008/9 was 51.2% of Graduate, 35.2% Undergraduate and 13.6% professional. Harvard's undergraduate student population is by far very much less compared to graduate students. Harvard also has a retention rate of 97%(Harvard, 2010d).

6.2.5 Addis Ababa University

Teaching and learning

Addis Ababa University (AAU) is the largest and the oldest public university in Ethiopia. It has started operation in 1950. Mission statements of AAU, at times, appear to be ambitious in that it opts to look like flagship of Ethiopian University. This can be attested by statement like "We build AAU into an autonomous, self-sufficient, and pre-eminent African university".

Recently, AAU is in the move to make a major reform in its internal policy under the umbrella of Business Process Reengineering (BPR). Reform in teaching and learning is one of the reforms. In respect to this, the university is in the move to introduce *General Education* into the undergraduate curriculum. Currently, the undergraduate programs lack *General Education*. This is due to the recent past shortening of the program from four to three years.

Teaching and learning is supported by designated center. The center for Teaching and learning support (CTLS) is a unit with in the university aimed at facilitating the organizational support for imparting General education and also assist junior staffs and targeted disadvantage students in teaching and learning process. (Addis Ababa University, 2010 a)

Professional undergraduate student involve in the internship program where students can have professional experience. Besides, students involve in the national service program. It makes students actively involve in civic awareness through living and learning outside their culture and language.

For graduate level education, the new curriculum under construction use the *Modular based*. It is intended to replace the old curriculum *Knowledge based*. The modular based curriculum stress identification of professional/ vocational, job specific and transfer skill a graduate may have upon completion and is competency-based. Also under the Modular system student follow single module at a time and usually one month for a module. The module is dedicated in mix of means of learning dedicating 40% of the time to interactive study, 40% independent study and the remaining 20% be in collaborative learning (Addis Ababa University, 2010b).

Further more, Addis Ababa University has opted to change the traditional credit hour system by European Credit Transfer System (ECTS). The masters program has two-option track, where students has to choose either to take course work and comprehensive examination or the other option is where student require to hand in thesis/ project work. Currently, the university offers around 64 undergraduate and 90 postgraduate programs. At post graduate level there is no such classifications as thought and research programs.

A clear move in the direction of bringing back *General Education* once again into the system and also the intention to harmonize the Ethiopian report system to that of Europe are some of the basic area of teaching reform at AAU.

Research

In Ethiopia, the Federal Government directs research activity by identifying area of research priority for the entire higher education institution. Then the vice president for research and dean of school of graduate studies (VRDSGS) forward it to the university's attention to align

with the university research activity. For instance the current research priority areas are environment, health, water, transport and communication, ICT, Tourism, agriculture, and animal health.

Internally the university has a policy of allocating resources based on scholarly and educational merit of the proposed research. Opening multidisciplinary new units are often evolutionary and much depends on availability of external finance. University has a policy of not funding visiting scholars and thus visiting scholarly activity entirely depends on external finance (Addis Ababa University, 2010 c).

Finance

AAU has planned to support its source of fund by opening a new enterprise. AAU, like many other public universities is almost entirely funded by the federal government. For instance, out of 478,038,500 birr budget for the 2007/8 year, only (7%) is generated internally. 2002 (MOFED, 2010 a). As it is depicted in the table below the administrative salary take the lion share of the universities expenditure which is a worrisome fact. The expense for the year 2007/8 AAU can be broken down into salary 42.2% salary, 47.5%adminstrative expense and 2% fixed expenses (MOFED, 2010b).

Organizational structure and leadership

Based on the recent proposed reform, AAU is organized based on colleges, which serve as a setting for schools, faculties and institution to exist, which in turn may constitute departments and programs.

'In general, the relationship of colleges to the schools, faculties and institutes related to them will be horizontal, not vertical. They will have little or no executive powers or roles in day-to-day academic work and administrative decision-making.'

The academic senate is the highest legislative and regulatory body on academic and community matters. The Managing Council and the University Council are the two bodies that provide advice to the president of the university. Likewise, deans of school/ faculties / institution have two consultative bodies Managing Council and Council (closely resembles the Academic council except for its consultative role.) As public organization, the University

Board nominates the president and as it has been seen in the system wide discussion, the Board is so much controlled by the government (Addis Ababa University, 2010d)

Below the president, there are four vice presidents namely; academic affairs, research and dean of graduate studies, business and development, and the vice president for external relation, strategic partnership and planning.

Relation with industry

One means of reaching service to immediate society is through consultation. Consultation can be of two kinds, one where university organizes and the other is consultation initiative taken by individual academic staffs. In the case of the university-organized consultation, the university insures staffs any liability arising from professional consultation and in return earn up to 15 %(5% to academic unit and 10 %to community service of consultation (CSC)) out of the gross earning. The community specifically organization provide an internship opportunity for student to experience first hand professional world experience (Addis Ababa University, 2010e).

Faculty recruitment

There are four president awards each for an excellent staff for their excellent demonstration on teaching, research, and community services and innovative artistic activity. The faculty staff population is extremely low, for instance there were only 1,357 staffs for the year 2006/7 (MOE, 2009).

The basic recruitment process falls on both concerned units of the university and the budget center HR. While the former in full control of the entire soliciting, short-listing, evaluating and making the last decision for employment, the latter perform the routine personnel function and allowing fund. Lastly, the central human resource will make sure that appropriate standards are followed and also keep employment and employee related records (Addis Ababa University, 2010f).

Student admission

Under the new reform, Addis Ababa University is planning to make admission decision for its own intake at undergraduate level. To this end, high school achievement, entrance exam

result, additional internal exam, students own educational context and diversity are planned to be used as criteria for admission decision. However, the current reality is to accept what has been allotted centrally (Addis Ababa University 2010 g).

For graduate level admission is based on undergraduate achievements and internal exam results. Other time published researchers are considered for post bachelor PhD.

For the year 207/8, there were 48,223 students at AAU that accounts to 20 percent of the public enrolment. Half of the student population, however, was part time undergraduate students. Of the remaining half regular students, around 21% were attending postgraduate programs. At the same time, the gender disparity is skewed sharply towards male students as the education level rises (MOE, 2009).

Table 3: Summary of major characteristics of selected case universities

	Cambridge	Oxford	Berkeley	Harvard	Summary and Comment
Teaching and learning	Old, private university; Peculiar Teaching &Learning with *Supervisory and Tripos;* students independent learning; Teaching technology, CamCORS and CamTOOLS.	Very old, Private Peculiar Teaching &Learning with the use of *Tutorial* Methodology.	Relatively the most recent, public University; Large student population; No peculiar teaching methodology; Teaching technology, bspace.	Old, private Closer attention to Students; Influenced much by Oxbridge.	Most are private and are old; Use teaching technology; Cambridge and oxford have peculiar Teaching and learning; Student independent learning.
Research	UROP, undergraduate students and research experience; RAE rated Cambridge's research highly excellent.	As evaluated by RAE Oxford produced more excellent research.	URAP, undergraduate student and research experience; Bulk research production.	Large size research out put and quality research from extremely excellent staffs.	Bulk production of research, high quality research; Research is part of undergraduate curriculum.
Finance	Fund from HEFCE and TDA, research grant and contract, student fee, and to lesser extent endowment income; Much of the funds can be directly traced to teaching or research; Less administrative expenditure	Fund from; HEFCE and TDA, research grant and contract, student fee, and to lesser extent endowment income; Similarly, much of the funds can be traced back to basic teaching and research; Less administrative expenditure	Major sources are research grant and contract, State education appropriation and tuition.	Major sources are Endowment, student income, and government grant; Depend a lot on private sources; Much of the expenses can be directly traced to teaching and research.	Diversified fund at least from four major sources: Research grant and contract, direct government fund, tuition, endowment income and revenue; Less administrative expenses; Directly traceable much of the expense to either teaching or research.
Relation with industry	Embedded companies; Big MNC's sponsor research.	Begbroke Science park ISIS innovation company.	Technology transfer office.	Office of Technology Development.	Technology transfers units; More collaboration with industry.
Staff recruitment	More contract researchers	Quality, diversity and discretionary payment scheme.	Employ highly qualified staffs; often worry about losing its staff to others; Few staff /student ratio	More concentration of brilliant staffs, More non-faculty staffs.	Make use of non-tenured staffs; Constantly looking for brilliant staffs.
Student admission	Extremely competitive assessment for admission using tests, essay and other criteria.	Extremely competitive student admission criteria.	Extremely competitive admission Advance placement, standard tests essay and interview.	Interview, extracurricular activity, personal qualities are used in addition to standard tests for admission.	Admission process is competitive and intense; Brilliant students are hunted.

Chapter VII:

DISCUSSION AND CONCLUSION

The following discussion uncovers the underling characteristics of the selected REU. It eventually helps in bringing a clear picture of what Model REU would possibly look like basing on the literature, conceptual framework, the research context and analysis chapter discussed earlier.

Now it is clear more than ever that Ethiopia is in cross road to choose the fundamental choice of bringing research and excellence in the higher education system and possibly change the sail of the nation towards advancement or see the opportunity to start this earlier slip away. The researcher argues for bringing excellence in higher education at this juncture.

As starter, research production in university facility often viewed as the base for knowledge production elsewhere and in context of solving practical problems (Gibbons et al, 1994; Gibbons, 1984). This is mainly because it is the primary place to train scientific norms and it also constitutes diverse basic discipline knowledge. Therefore, research production in university is a necessity. This being the case, in all the selected case universities, the size of research activity as measured by the faculty staffs, contract researchers and postgraduate students is by far extensive.

Excellence research production is function of number of researcher and innovativeness of these researchers, among others. Hence, the selected universities staff composition and Postgraduate students have so much to offer in terms of quality and production size.

In most of the case universities, full time academic staffs are few compared to contractual researcher as the case is at Cambridge and Oxford or otherwise depicted as non-faculty staff in Harvard. Oxford also separates research staffs from the academic staffs (teaching staffs) at least for reporting purpose this may be just an intent to show the emphasis on quality and size of research production. It can be deduced that contract researcher and non-tenure academic staffs are complementing tenured academic staffs in research production.

Postgraduate students, especially PhD students are often used as point of reference in identifying RU (Taylor, 2006). PhD students are among key members of the academic community for they turn in research of their own, collaborate with other staffs and engaged in academic seminar, among others.

In the entire case universities, all possible disciplines namely; pure and applied, hard and soft, as well as multidisciplinary are integrated in the system. This can be traced from the range of subjected offered. Yet, the expenditure based on discipline differs as it is portrayed in Oxford and Berkeley, where the highest spending faculties are like Medicine, Engineering, and Mathematical, Physical and Life Science. This closely aligns to Becher's characterization of 'urban divergence' or privileged fields (Becher, 1987). They have multiple meaning in that; there are many researcher, more fund at their disposal and expensive as well. More or less an all rounded research activities describe the case research universities.

The analysis has also shown that there is no a single research kind (basic, applied or strategic) in which the case universities evidently favoring one over the other explicitly. Institutions' production of basic research is as likely as strategic or applied research. The support towards basic research may be seen in the institution interest on publication and patents. Nonetheless, basic research are likely to be performed at department level till the time that applying to real life problem is apparent and then possibly move to places where researchers and business enterprise work in close collaboration, places like Science Park or Proximate companies to become strategic or applied research. 'Begbroke Science Park' of Oxford, 'embedded company' of Cambridge and Technology Transfer Offices shows the extent of involvement towards commercializing research as well as the extent production of strategic and applied research.

Researchers are motivated to do research by both external drivers (stakeholders) and internal intellectual curiosity (Bushway, 2003). Hence, it is important to pay attention to external scrutiny (government, universities, public, business and industry) and academic peer groups, as they can influence the quality and quantity of research out put (ibid). In some instances, researchers are scared of touching sensitive issues for the finding may disappoint the incumbent government. This is against the core idea of academic freedom for it limits

researcher's choice of topics, as well as the right to publish finding. This is a common phenomenon among developing countries (Altbach, 2007).

In addition to this research is shaped by funders and teaching and research link. Yet, there isn't any consensus among scholars as to the kind of influence of teaching and researches have on each other (Hattie and Marsh, 1996; 2002). However, participation of undergraduate student in research at early stage may have a positive effect on students learning. It will also draw students towards considering career in research.

As it can be seen from the case universities, research practice can hardly be dictated by single source. This is because the source of fund is diversified as it could come from either endowment, or private and public research contract.

When it comes to research, the current practice in Ethiopia is top down policy, where research priority is identified and directed at national level for individual institution to follow. The policy is solely devoted in defining area of priority and nothing else is said about its quality. In a way this provide institution a room for improving the level of excellence.

One of the most disappointing facts is that the production of research is by far few by any standard. The major reasons for few research productions could be lack of fund, few researcher population, little attention given and unsuitable institutional set up. The unsuitable institutional set up includes absence of academic freedom for the fact that most of the UNESCO recommendations on academic freedom are not observed in Ethiopia (Semela, 2007). In addition, staffs are reluctant to practice even what has been granted by the proclamation (Saint, 2004). Further more, staffs working condition is worsening as a result of massification (Tessema, 2009).

In the selected case Research Universities, institutions own course of maneuver dictate research and not by external force. On the other hand the Ethiopian case universities; the heavy hands of external stakeholders dictate the direction of research. Institution's immunity is dragged down perhaps among others by the very weakness to finance its own research, as there is no separate source of fund for research. As a result institutions are chasing after area's of research where funders are interested rather than the nation or institution areas of interest. In turn this result in an extremely unequal level of research engagement across discipline and

fields with in institution. This chaotic behavior of research production would be alleviated by awarding institution more to finance fundamental research in short run and diversify source of fund in the long run. Also as a remedy to the chaos, re-engineering the knowledge system has been suggested among other through, a) integration of higher education and science and technology office and b) formation of National Research Council (Teferra, 2010b).

Identifying an excellent teaching methodology is by far difficult. The analysis part shows that usually successful research universities do have long history of existence. Through this course of time they shape teaching and learning by creation and recreation. At times they own a particular method of teaching or evaluation to the extent that the method is unique to the university. These can be seen from Oxford's '*tutorial*', Cambridge's '*supervisory'* and '*Tripos*'. These methods are owned by their specific institutions and operate concurrently with in a system that is not familiar to such methods.

On the contrary, as has been evident from the case, universities like University of California, Berkeley which do not own a specific methods to identify with, operate like similar other public university by trying to cope with pressure of mass students and yet achieve excellence in its teaching. Therefore, from this study, it is safe to assume that excellence is not attached to particular methods of teaching and learning, though there are instances where excellence research universities happen to have their own peculiar teaching and learning methodology.

A university can be excellent in teaching and learning with out following single specific methodology. Then, perhaps excellences come not from single teaching and learning methodology, and thus better not to look for one all encompassing methodology. This lead into the discussion of exploring blends of characteristics that could possible result in excellence in teaching and learning.

Looking thoroughly into the teaching-learning environment, one can find student contributing for excellence. Students are admitted after a through and rigor admission process. Hence, student body is collection of brilliants, best of best, and they are likely to follow the deep approach to learning. At the same time the staffs, as they are highly brilliant, are likely to follow deep approach to teaching (Prosser and Trigwell, 1990). As a consequence of both staffs and students following deep approach to teaching and learning excellence in teaching and learning can be realized.

Education process is often described as customer-input technology; students participate in consumption of product, education (CHEPS, 2002). In addition, students learn outside classroom from peers. In this case, all these brilliant students, as result of selectivity of RU, are likely to engage in more intellectual activity than otherwise the case in other universities.

Another common characteristic seen across all the case study universities is the use of teaching technology to enhance the teaching learning activity and possibly this has greater impact on achieving excellence. For one thing, by providing a platform for academicians at institutional, national, international level to communicate and also strengthen staff versus student communication for feedback and learning. Beyond the communication platform, synchronizing teaching technology into curriculum provide 'overall positive learning experience' (Bekele, 2009) for students. At the same time the use of teaching technology could improve teaching, learning, and research as sources of knowledge (where a lots of information are online these days and often for free).

As the number of discipline offered by the selected case universities ranges from 150 to more than 300, indicate that excellence in an institution is not about concentration on specific discipline and it is possible to be excellent across several spheres of programs. Research universities are overwhelmed by multidisciplinary, interdisciplinary and transdisciplinary fields. Nevertheless, concentrating in few but diversified fields is attractive in order to reduce the cost of operation. Besides concentrating in few programs makes managing easy at least in the beginning.

Contemporary phenomena in RU include bringing teaching and research closer (Brew, 2006), though it is limited by discipline and level of study (Smeby, 2000). The participation of undergraduate students in research as seen clearly at Cambridge and Berkeley, is an indication of undergraduates learning the real process of knowledge production.

Further, the curriculum found in Cambridge, Oxford and Harvard is designed in such a way that students independent learning is at the core. Therefore, the teaching and learning in the case research universities can be characterized as research based and research oriented (Griffths, 2004), where student learn the research process or as researcher. It is possible to conclude that among the four possible teaching and learning model with in RU (Shulman,

2004); the two models, namely teaching of interdisciplinary and the uses of technology are the widely seen phenomena.

Bringing the Ethiopian case into the discussion, undergraduate students involve in professional internship and national service program that is much on practical experience. Still the undergraduate students experience is more of preparing students for professional job. This is an appreciative effort; however, as can be drawn from the discussion above, RU includes research experience into the curriculum by arranging kind of research internship. The use of teaching technology in the curriculum is almost negligible, as can be seen from the AAU case. If the strive is to have such an excellent university, it is better to consider bringing teaching technology into the curriculum.

In Ethiopia, the undergraduate curriculum is designed in such a way that much of teaching and learning is meant the transfer of information from teachers to students, so much so that it has totally lacked to embrace students' independent learning. It is obvious from the case RU discussion earlier that students' independent learning should be part of the curriculum to excel in teaching and learning. As to graduate level study, the curriculum support student independent learning to certain extent, 40% of the time.

Equally importantly, in Ethiopia, undergraduate students enrolment so far has been controlled centrally. It bases on random allocation students to all institutions, where equal distribution of talent is the ultimate goal. As described in the analysis part, REU enroll their students after fierce competitive selection process. Therefore, the current practice is incompatible to the very idea of RU.

As to staff recruitment, there is no data on how recruitment is practiced across selected cases due to the fear of harm of disclosing the procedure might bring. Nevertheless few things can be said. First is the fact that institution like Berkeley has a general view that it has been losing couple of its renowned academician for other private Ivy League Universities. Similarly, fear from the UK that they are losing talented staffs to the US. Above all the difficulty stated by many UK universities at national levels as to recruiting staffs should not have to be forgotten. From all this fact it is obvious that one cannot stay as competitive as it used to be and always has to work hard to maintain or to regain it in case of losing. Here, the lesson is that retaining staffs is as important as recruiting. This leads to the internal staff retention mechanism of RU.

Researchers are lured by attractive research environment; that pays more, recognize achievements, have high quality facility, have freedom and so forth.

The Ethiopian higher education system does lack an environment that supports staffs to produce more as well as quality researches. This is due to the fact that staffs are overburden by repetitive, non-professional activity and often are not recognized for their achievement (Tessema , 2009). In addition to this, as the majority of the staffs are first-degree holders; hence, engagement in scholarly and research activity is limited.

It is relevant to remind what Ruffin and Bland has characterized as productive research environment, (the personal characteristics) namely; substantial uninterrupted time, socialization to academic values, network of productive colleague and so on (Ruffin and Bland, 1992). Owning to this fact, the current environment push an already existing staffs to seek other employment let alone attract the brilliant one. It seems that the environment got in the way of the formation of an academic culture that will ultimately be positive ground for research production. Thus, a dramatic turn around is needed so that brilliant staffs shall be recruited and retained as well as the morale of staffs to be raised in order to build better scholarly culture. This in turn pays off at least in the long run in terms of quality and quantity of research out put.

With respect to organizational structure and leadership, a strong leadership with devolved responsibility (Taylor, 2006) and flat organizational structure (Birnbaum, 1983a) are some of the suggestion that are supposed to suit RU. In addition, Kerr has also argued for RU to have participatory leadership (Kerr, 1984).

As it is seen in the previous case analysis, universities found in UK has figurative head called the chancellor similar to the kingdom's Queen; this is an obvious reflection of national governance system on individual university's governance.

Cambridge and Oxford are organized around multi campuses. On the other hand, Berkeley alone, which is part of University of California, which is also part of the university of the state of California, is in turn part of the larger system of US higher education and it is as

prestigious as the rest are. This leads to the need to own much more institutional autonomy to pursue on excellence.

Cambridge and Oxford has the legislative and the executive body that are clearly distinctive, with the legislative body being the 'House of Regent' or 'Congregation' and for the executive part being the respective University's Council. The Council has greater power in shaping universities environment and have much power on detail execution of broadly expressed policies of the legislative body. As the Council is crowded with academician, the management of the university seems to be in the hands of academicians. Here it is important to remember Clark's reference of the UK system where more power lies in faculty (Clark, 1983).

The arrangement is different in the case of USA. At Harvard, Board of Oversee runs as legislative body receiving advice from the Corporation. The Corporation is governing body with academician being majority of its constituency. On the other hand, University of California Board governs Berkeley at distance, as the Board stands for all 10 campuses under it. The often-referred word in Berkeley governance '*Shared governance'* shows the implementation of participatory leadership. Bearing in mind Clark's discussion of the US University's Board of Oversees being powerful than the faculty and also the very fact that Federal government involvement is limited.

The autonomous of institutions can be witnessed where in UK, Congregation and House of Regents are supper size and they run like parliament. The Board of Oversee of US case universities are by far small in size and appointed by regional governor (as the case is at University of California Berkley) or selected by the incumbent members (as the case is at Harvard). The Board of Regent of the public institutions are appointed by governor, in a way shows the decentralization nature. A clear effort to distance political interference from the management of institution is in place.

The Ethiopian higher education institution's organizational structures are similar to the case study universities in the existence of University Board and the Senate, performing the very same function of legislative and executive task respectively. However, the way members are nominated or at time appointed are quite different. Here, the presence of heavy hand of

government is manifested, contrary to what ought to be autonomous. For instance, majority (four out of seven) of the Board are central government appointee.

Apart from the fact that central government dominating institutional management, Ethiopian Higher education institutions have suffered from their own poor management including poor resource utilization and lack of information management (Yizengaw, 2003). Given the characteristics of REU, capacity resource utilization and information management system bear paramount importance. Hence, the Ethiopian institution's structure is quite the opposite of REU's expectation.

Often RU employ professional manger to deal with the task of handling resources allocation; marketing and promotion; liaison link between university and business; and university and international organization (Bushaway, 2003).

With in the research unit and department, research leaders take in charge of organizing and leading the research production. As it is seen in the literature part, research leader need to be highly respected scholars among their colleague nationally and internationally (ibid). Hence, they should be identified and given the appropriate room to take in charge of gearing the research activity. In this regard, lack of an already research population in Ethiopia and particularly in the higher education institutions tremendously deter research leader formation to the extent that reputation takes time to build among colleagues found home and abroad.

Coming to the discussion on finance, it can be seen that funding is diversified in all case study universities. Thus, similar trends can be traced in all universities as among major sources of funds are; government block grant, research grant and contract, endowment income, student income and other internal service income (CHEPS, 2002; Herbst, 2007). The cases of UK universities, around half of the funding comes either directly from block grant or research grant. Endowment income and student fee hardly account 20 percent. When it comes to US case universities, student fee alone is among the major source by contributing up to 20%, larger but closer to the national average (17%).

Unlike the other case universities, Harvard shows peculiarity in its major source of funds in that close to half of its annual fund comes from invested endowment. Thus, Harvard least

depends on government grant (only 15 percentages for the year 2009) compared to the rest case research universities.

In all other universities, no matter how diversified their finances are, much dependency on public fund is seen in one-way or the other. Nevertheless, majority of research fund comes through research contract from several government sectors. Apart from the fund for the basic operation of teaching and research, public funds are used to boost excellence. For instance, majority of the public funds goes to Ivy League university in the US. Likewise, top universities in the UK such as Cambridge and Oxford receive large fund. Often it is believed that excellence can be brought through competitive funding. That is why much of excellence initiative is channeled through funding.

On the other hand, Addis Ababa University depends to a greater extent on single source, public finance. Internal generate income account only around 7 percent. There is no clear distinction of funds for research and teaching. While, this provides an opportunity to subsidies each other (teaching and research), it also presents itself with the danger of leaving one to prosper over the other. In this case, since graduating as many students as possible has been the priority, funding for research activities are neglected. Hence, research production is suffering.

In most case research universities, administrative expenses are by far less and hardly account to 10 percent. This could possibly be due to either the fact that the system is more efficient or the other possibility is that of academic expenditure (expenditure for teaching and research) by far higher. In most of the cases more than 50 percent of the expenditure can be directly traced to teaching and research. On the contrary, a worrisome fact is that AAU's highest expenditure is for administration, around 42.7%.

The triple helix close interaction of government, university and industry in common knowledge production and application (Etzkowitz and Zhou, 2006) is not new to both countries (UK and USA) as well as to the selected case research universities. The existence of giant successful multi national companies in closer locality has helped the university make alliance with these business organizations.

Universities arrange a separate small space like Science Park with in the university so that business entrepreneur and research staffs could work together and research grant from the public just complement and intensify the spin off companies and innovation. The California state's injection of money into the possible university industry partnership is one of the cases where state government moves to forge partnership with university and industry. Apart from such sporadic moves, there are few documentations of initiative on project where university, business and government work in close collaboration. Nevertheless, government, business and academic researcher do take part on projects of their interest on mission that are common with out compromising much of their respective missions.

The other apparent phenomena in all university is the existence of technology transfer offices often funded internally by the universities which would have been difficult to get finance until the innovation reaches certain stages of development to convince business to take the project in.

In Ethiopian case though it is a national interest to engage in technology-transfer research, as it is among key mission of higher education, there are no practical reality at the ground. It is obvious from the case Addis Ababa University that there are no spins off companies, Science Parks or technology transfer units. It is partly due to the existence of only few big industries, as unlike the other case country, Ethiopia is an agrarian country), and partly lack of platform for such engagement. This seriously hinders among others the commercialization, practical application of research output, reaching out to society as well as the possible source of fund. Most notably this limits institution from reaching out to society.

Finally, when it comes to student admission, it is clear from the cases research universities that students are admitted to program after a very competitive and selective process. For undergraduate standard tests score like ACT, SAT, GCSE are in use. In addition to this, non-standard tests like interview and essay writing are used to evaluate candidate students. Further, non-academic qualifications like students extracurricular activity are also considered in making admission decision.

It is true that as a result of the admission being rigorous, the retention rate is significantly high. It is also partly because highly motivated and capable students are able to secure

admission. Study has found that there is a correlation between selectivity and university ranking (CHEPS, 2002).

As for postgraduate admission, in addition to achievement in undergraduate program and work experience, students are at times required to take program specific tests. Both undergraduate and graduate programs allow student mobility and in few occasions, highly talented students from another institutions may pursue their study in these highly prestigious institutions. Also, it has been seen in Berkeley's case where talented students are hunted even when they are attending high school. From the whole student body, postgraduate student proportion ranges from half for Harvard to more than one-third for all other case research universities.

As to the Ethiopian higher education, for undergraduate talent are almost equally distributed across institutions centrally. Standard tests and to a lesser extent student interest is taken into account for enrollment to specific department. For postgraduate; however, institutions have a privilege to recruit their students, in most cases use only standard tests. If an excellence university is to be sought, it is important that institutions enroll their students. At the same time institution need to be aggressive in identifying talented students not only by means of standard test, but also making use of non-standard criteria. Thus, making use of interview and essay can probe more information about individual ability like giftedness, leadership ability and interest.

7.1 Model Research Excellence University

As it has been seen from the discussion ahead, the task of creating REU is so enormous that it is impossible to leave to single body to handle. Yet, there must be an entity that needs to be in charge of or take the lead. In this regard, it has been obvious that the usual norms for research excellence universities to be private non-profit institution. In Ethiopian case, however, private for not profit organization has never been in higher education arena but has a culture of engaging in humanitarian and other development related project.

At the same time, for profit private higher education could not be relayed to take profound excellence initiative as they are characterized as only small family owned venture. Apart from the very fact that they are less resourceful, private for profit universities are driven by

profit and; hence, there is good chance for excellence to be down graded against profit. This leaves the government through its public universities to be in charge of creating REU.

An equally important question is then whether or not to concentrate in selected few institutions. The trend is pointing towards concentrating and nurturing few institutions so that other institutions in the system aspire and ultimately raise their standing by virtue of institutional isomorphism (DiMaggio and Powell, 1984). It can be evidenced from the very platform of funding mechanism where few institutions are favored for their past excellence achievement. Several countries too are inclined towards concentrate their excellence scheme against diversifying across institutions.

Now two things can be established in Ethiopian case. One is that government should take a lead in creating REU and the other is that concentration is becoming more compelling. As starter the government need to be convinced in the very idea of research excellence as having a far-reaching consequence to the nation. In line with this, it is important to remind the fact that differentiated elite institution is welcome by large array of society (professional, students, international higher education and so on) as well as elite production has never been halted (Marginson, 2009).

Besides, it can be argued that, it is a natural evolutionary process that some institution by virtue of their resource, management, or constituency likely to be different from the rest, as nicely portrayed, diversified institution. There is nothing unnatural about a differentiation as scholars have explained it with natural phenomena (Van Vught, 2007; Birnbaum, 1983b; Kyvik, 2009). Also, internal environmental and external conditions (Vught, 2007) play great role for institution to diversify.

Since differentation is evolutionary processes that may take time realize, speeding up the process is deemed necessary. To speed up the process, the government (Ethiopian) specifically should perform three bold activities namely; legitimization, encourage competitiveness and finance.

7.1.1 Legitimization

Legitimizing means providing justification for establishment and continuation of REU. It is more than a mere political endorsement and requires reference to higher education in legislation. As noted in the discussion part, research excellence universities deviate from the norm in their characteristics. Therefore in creating such universities, one should need to recognize the fact that they are different and hence need to be treated differently. Legitimization can be strengthening further through autonomy and academic freedom.

Autonomy

The case RUs have reached to their present standing through evolutionary process of many years. Through this time they have accumulated talent and resources of course legitimized their strong standing. To create a new one need to see them in different eyes. When REU is treated differently for it has high concentration of competence, other institutions do react. Thus, REU may be seen as anti-democratic (Clark, 1983) or unjust and result in exclusion. Hence, at least in the beginning with all the justification need protection. Protection includes; preventing the interference of politics, letting the ground be purely intellectual, letting the rule of merit prevails. The legitimization in addition to justification provides protection.

REU requires more independence in managing its affairs. It means relinquishing power to individual institution. It also means letting institutions make decisions like: change curriculum that suits best; select its own student body; manage its financial matters; recruit, remunerate and retain its academic staffs; forge business ties and so on. Institutions in performing this function with absolute autonomy, will work towards excellence. REU really know well on how to perform in the best interest of the institution and one of these interests has been and will be to excel in performance. Hence, little bit of trust will let institution to excel. The principal priorities of a university research policy should be to sustain the vitality of scientific community (Geiger, 1985). Awarding autonomy and freedom can strengthen the vitality of scientific community.

Academic freedom

In the very essence of research lays the freedom of the investigator to choose topic to research up on and present an objective finding. Intimidation or fears of any kind in either selecting topic for investigation, or in conducting the study, or communicating findings are against the

essence of research. Hence, the chance for research to prosper in such environmental set up is minimal. Therefore, for research to prosper academic freedom is one of the basic requirements.

7.1.2 Encourage Competitiveness

As it follows from the discussion, excellence can be built through engaging competitive activities. For instance, contract research or research funds are granted after RAE or through competitive evaluation of research proposal; competition can be seen in selecting the best students or academic staffs; student's independent learning curriculum is all about competition.

Arguably, the Ethiopian higher education system holds back institutions not to differentiate through various legal and bureaucratic mechanisms. This mechanism makes the system to lack the most fundamental ingredient, competitiveness. The best is not recognized and rewarded. There is not any urge for institutions to aspire excellence. If there is anything that institutions are urged for, it is not quality but how many students they will enroll or graduate, or number of programs they plan to open.

The mindset to treat every institution as equal may be good as social justice principle, but recognizing and rewarding the one that do better is a base for excellence. It not only rewards the best for their performance, but also create an atmosphere of competition. It is the easiest way to bring as well as sustain excellence.

For competition to surface, evaluation is a sort of the basic ground. One of the driving forces towards competition is the existence of a solid system of evaluation and a reward for those who perform better. In the west, there is a well-developed peer review system that ultimately identifies the best scholar from the rest. 'Academic self regulation (through communication, evaluation reward etc)' is essential for scientific progress and excellence (Geiger, 1985). The existence of many professional organizations at a national level also helps in recognizing scholarly work of academician. They are also the breeding ground for scientific culture. 'Scholarly publications and associations serve as important venue for scholarly dialog, research communication and information dissemination' (Teferra, 2010a)

As it has been seen in the cases, UK's RAE and the US's professional and accreditation institutions all are forcing institution to advance through competition. The selected case university have done well at least in the case of UK, where there is an independent peer review, RAE, on aspect of quality of research as well as quantity of output.

The RAE review result in high points for Prestigious universities like Oxford and Cambridge which in turn leads them to receive greater portion of the public grant for their high performance. This circle will continue to reoccur again and again and have an impact of high size and quality production of research in selected few top universities. Therefore, Buffer organizations that are involved in accrediting and evaluation, check and balance institution's performance by mere ranking up or down in the ladder. They do play a crucial role in creating REU. Similar fact exists with the US higher education system. There are independent evaluations for almost everything higher education institutions perform.

Impliedly, through peer review researcher's scholarly work get recognized. Those highly recognized researchers are likely to attract grant and also lead research group in their area of specialty. Again, these researchers are concentrated in few research universities; for which other successful researchers would like to work with them, makes recruitment easy; for which brilliant students would like to learn from such staffs; industry would like to work with; they can easily attract research fund and contract. In one way or other many stakeholders would like to work with excellent researcher, students and university. All of these phenomena are working towards excellence in; research production, teaching and community service, most notably to fulfillment of a high standard intellectual environment.

7.1.3 Finance

Another external environmental condition for institution to diversify is through finance and its mechanism of allocation (Palfreyman and Tapper, 2009). Creating REU prominently requires pouring large amount of fund and making sure that the fund will sustain. Finance is very crucial in setting up and running RU. For one thing the average expense for staffs, infrastructure and running teaching activity to the highest standard are all costly. In addition, the massive research undertaking by itself is expensive.

As can be evidence from the case study universities, endowment fund is one of the major sources of income. REU need to capitalize in the future in this realm. Both institution and government need to advocate philanthropic culture for which at present is non-existing. Scholars have advocated opening endowment office and alumni relation office (Teferra, 2010b) to raise fund.

In addition, research fund should better come from several sources, like several government sectors granting research contract, where such arrangement reduce single source dependence.

The mere existence of resource does not create excellence. REU requires not only more resources but also competitive mechanism for its allocation. The fund should serve as pulling factor to excellence by intensifying competition among institutions, staffs, students, research units and so on. Establishing clear relation between finance and excellence makes institutions, students and researchers to strive for excellence.

7.1.4 The Research Excellence University

Once again referring to Vught's condition to create differentiation is through the internal environment (Vught, 2007). The internal environmental condition among others includes to appeal through; image, quality and student selection (Kogan, 1997).

To start with, all the case research universities have their name (good will), which has been accumulated through long year of their operation, and it appeal to wider section of society-can also be translated in to money. Hence, building a good name (Brand) should start by publicizing its special mission, purpose and vision. In this regard, a particular REU has long way to go to firmly establish that it is a flagship, or has special purpose, or is excellence etc.

Identifying certain discipline for engagement in teaching and research that are in close align with the country's area of priority is also required. At the same time, not letting any external body dictates institutional activity is necessary. Yet, institutions are required to embrace inputs from stakeholders notably from society. The institution needs to reach out to the society.

REU's research better have the mission of solving current threatening problem of the country like health, agriculture, and poverty alleviation. Finding means of integrating indigenous knowledge into university operation in particular is relevant for it is the easy way of reaching out to society as well as integrating research culture into institution and society at large. In this regard communicating research results to the general society should need to be consider. Reserve fund as a means to cultivate small business (Spin off companies) to arise from the institution's research and innovation.

The curriculum REU encourages students' independent learning, integrates research and teaching even at lower level. In addition, teaching technology is also an integral part of teaching and learning. Similar arrangement is expected from the REU.

More or less concentrations on Masters and above programs with particular emphasis on research degrees are the highlighted in the case research universities. At least one third of their students are postgraduate level. This assisted REU to produce more research through PhD students apart from contract researcher and internal academician. Hence, REU is required to educate more PhD students.

Finance is required in performing major activities such as hiring the brightest staffs, recruiting the best students, modernize infrastructure and incorporating the best teaching and learning technology. At the same time institutions need to be accountable for all expenses by proofing that expenses are in line with the nation's mission and institution's alike.

Identify a mechanism to swiftly diversify source of fund in the long run. Possible consideration in this realm shall be research grant and contract from Industry, philanthropic, research grant from non-profit organization and commercialization of research output.

REU also have absolute say whom to enroll as students and whom to employ as staffs, for which merit should always be the prominent criteria.

REU has been characterized to exist in flat organization structured. Academician should also participate substantially in the management of the university.

The table below provides the list of possible impact when REU makes specific action with the available resources.

Lastly, achieving Research excellence may take so many years in spite of all the effort of speed up and need to be patient, as its fruit cannot be reaped over short period of time.

Table 4: The implication of integrating resource and action

	Resources needed	Set of activity	Impact
Teaching and learning	To build infrastructure for-teaching technology; To hire more excellent staffs and pay attractive salary.	Open more discipline, interdisciplinary, multidisciplinary programs; Students independent learning; Integrated teaching technology.	Wide range of programs; Better teaching quality as result of talented students, staffs, and better curriculum.
Research	More funds to engage in several fields of spheres; Support to hire more research staffs, contract researchers, and Research students (Phd).	Support Peer review activity, publication; Engage in more, multidisciplinary, Interdisciplinary and transdisiplinary research; Involve undergraduate students in research experience.	More production of researches as a result of a number of PhD students, contract researchers, tenure and non-tenure academicians; More quality research; An early undergraduate students experience in research; Better intellectual environment.
Industrial relation	Funds for Science park; Spin off companies, technology transfer unit.	Forwarding faculty research towards application; Commercializing research production.	Additional source of income; Better university -industry link; Solve real life contemporary socio, economic problems; Boost rate of industrialization.
Finance	More fund; Diversified source of fund.	Diversify sources of fund. Consider endowment, contract research from several sectors; Internally allocate finance in a way that boost excellence through competition; Minimize administrative cost.	As a result of more and diversified finance, institution become financially autonomous there will be financial sustainability; Competition for finance drives excellence; More money shall be spent on the core activity-teaching and research
Students and staffs recruitment	More fund to pay high for brilliant staffs; More subsidies per students; More finance to recruit bright staffs and for students selectivity process.	Bright student and staff hunting mechanism; Rigorous student admission criteria; Retain academic staffs once employed; Hire professional managers for they are expert in resource allocation.	Student learning from each other and compete against each other; Staffs competing for recognition produce quality and more research and teaching; An academic culture that has profound impact on excellence.

7.2 Limitation of the study

This study has limitation in that data are collected from single source, document. This resulted in lack of what is referred to as 'triangulation' (Babbie, 2007). Triangulation is a method where several sources are used to collect data about the same phenomena. Maximizing sources of data is likely to robust understanding theme. In other word, since the study uses document content analysis, it is limited to the extent by what is recorded in the document (ibid). Particularly, the Ethiopian case is constrained by availability of only few written account.

In addition, As Atkinson and Coffey put it: 'documents are not transparent representation of organizational routines, decision-making processes or professional diagnoses'(Atkinson and Coffey, 2004). Hence, the researcher have Specifically encountered the weakest link in this study with respect to collecting data about recruitment, leadership and management.

The researcher also admit that previous experience both as student and staff in Ethiopian institution together with current experience as students in one of Norway's most prestigious institution certainly influence the way phenomena are perceived. As much as the experience contributes substantially as an input to this study, it does hamper to incorporate outsider's view (Merriam, 1988).

Finally, this study has developed entirely on specific cases to serve unique purpose; therefore, it may have limited transferability. In other word, due to the specificity of the study the extent of generalizability is reduced.

7.3 Suggestion for further study

The researcher would suggest a further investigation on REU's management, leadership and recruitment as this particular study suffered from lack of data on those areas.

It will also be interesting to identify specific discipline or inter-disciplines for Ethiopian REU' prior engagement, as early impact to boost national expectation on development agenda can readily be depend much on areas of concentration.

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